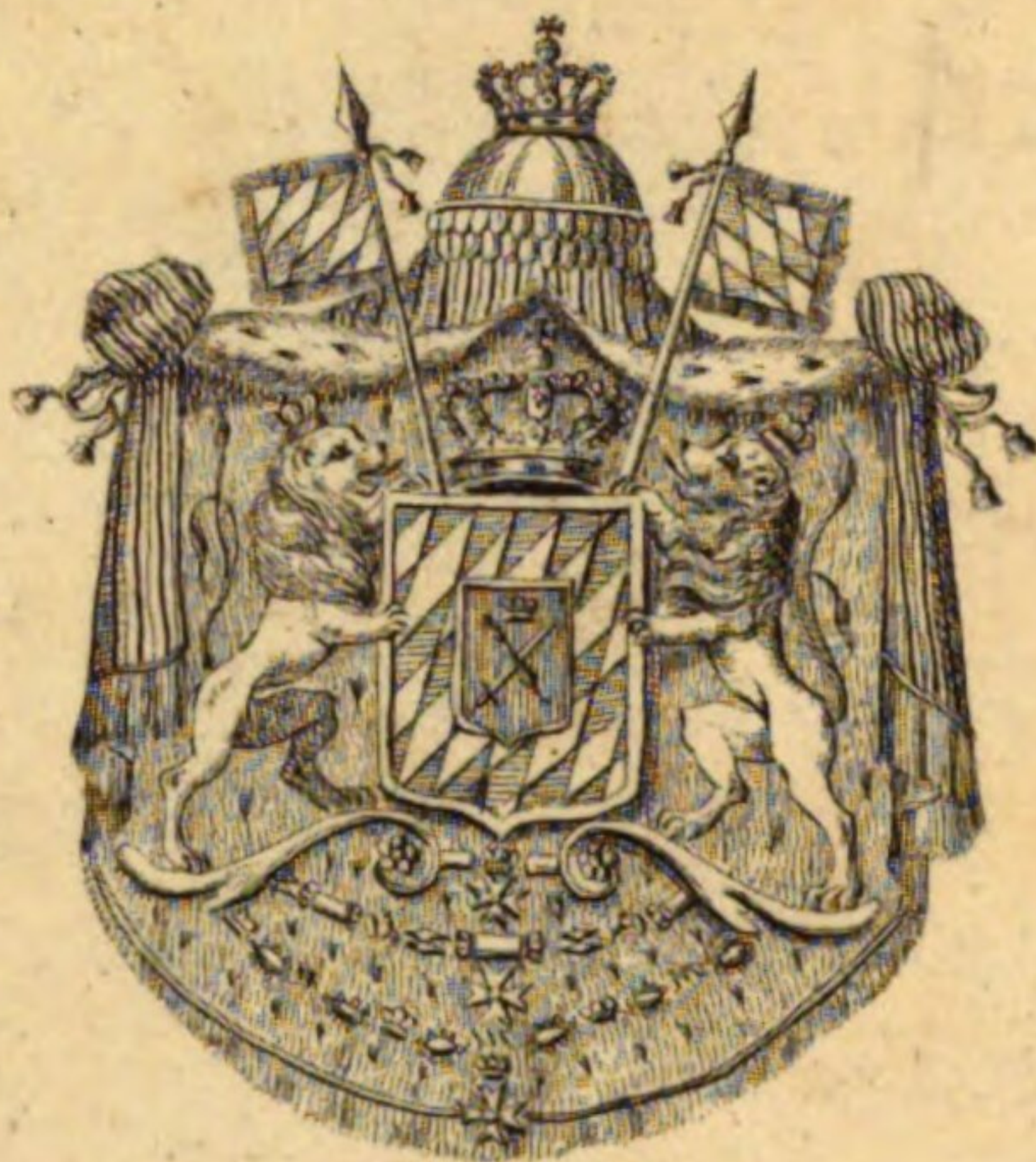


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BIBLIOTHECA
REGIA
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AMERICAN

MEDICAL BOTANY.

JOHN H. COLEMAN

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NATIVE MEDICINAL PLANTS
AMERICAN
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VOLUME III.—PART I.

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BEING A COLLECTION
OF THE
NATIVE MEDICINAL PLANTS
OF THE
UNITED STATES
AND THE
BOTANICAL HISTORY AND CHEMICAL ANALYSIS
OF THE
MEDICINE, DIET, AND THE ARTS
VOL. III - PART I.
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BEING A COLLECTION
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CONTAINING THEIR
BOTANICAL HISTORY AND CHEMICAL ANALYSIS,
AND PROPERTIES AND USES
IN
MEDICINE, DIET, AND THE ARTS,
WITH
COLOURED ENGRAVINGS.

==
BY JACOB BIGELOW, M. D.

RUMFORD PROFESSOR, AND PROFESSOR OF MATERIA MEDICA IN
HARVARD UNIVERSITY.

==
VOL. III.

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AMERICAN
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OF THE

NATIVE MEDICINAL PLANTS

OF THE

UNITED STATES





PREFACE TO THE THIRD VOLUME.

THE subjects of the present work, for reasons which prevail in many publications of the kind, have been inserted without reference to any particular arrangement or system. Those plants received the earliest place, the observations respecting which were earliest matured, and the drawings of which were first completed. Although this plan has been objected to in some foreign criticisms, it is the one pursued in several of the most extensive and useful botanical works of the day, which are accompanied with plates; and in periodical publications, or those which appear in successive numbers, it has more than one decided advantage. It gives time for all the figures to be completed at leisure, from perfect specimens, in proper and convenient seasons; at the same time that it does not necessitate premature and imperfect descriptions of their subjects, which must take place were an arrangement adopt-

ed, which might require the first insertion for plants not yet obtained or imperfectly examined. A systematic method may be adhered to in a work which is furnished for the press at once, but must occasion delay and imperfection in a periodical one.

As the American Medical Botany is terminated by the completion of its third volume, the opportunity is now afforded for taking a methodical view of its contents. Considered in a medicinal point of view, the subjects will be best classed as in systems of Materia Medica, by a reference to their leading properties or most striking modes of operating on the human system. In this light they may be arranged as follows.

Narcotics.

Datura Stramonium,
Conium maculatum,
Cicuta maculata,
Hyoscyamus niger,
Nicotiana tabacum,
Solanum dulcamara,
Kalmia latifolia?

Astringents.

Geranium maculatum,
Statice Caroliniana,
Arbutus Uva ursi,
Rubus villosus,
Rhododendron maximum,
Nymphaea odorata,
Myrica cerifera.

Tonics.

Menyanthes trifoliata,
Humulus Lupulus,
Eupatorium perfoliatum,
Coptis trifolia,
Cornus florida,
Gentiana Catesbæi,
Aletris farinosa,
Polygala rubella,
Sabbatia angularis,
Prinos verticillatus,
Liriodendron tulipifera,
Magnolia glauca.

Acrid stimulants.

Arum triphyllum,
Ictodes foetidus,
Ranunculus bulbosus.

Emetics.

Lobelia inflata,
Phytolacca decandra,
Gillenia trifoliata,
Veratrum viride,
Sanguinaria Canadensis,
Iris versicolor,
Apocynum androsæmifolium,
Dirca palustris,
Euphorbia ipecacuanha,
Euphorbia corollata.
Erythronium Americanum.

Solidago odora,
Gaultheria procumbens,
Laurus sassafras,
Illicium Floridanum.

Diuretics.

Juniperus communis,
Pyrola Umbellata.

Expectorants.

Polygala senega,
Asclepias tuberosa.

Cathartics.

Podophyllum peltatum,
Juglans cinerea,
Triosteum perfoliatum,
Cassia marilandica,

Demulcents.

Panax quinquefolium.

Anthelmintics.

Spigelia marilandica.

Diaphoretics.

Aristolochia serpentaria,
Asarum Canadense,
Xanthoxylum fraxineum,

External stimulants.

Juniperus Virginiana,
Rhus Vernix,
Rhus radicans.

We avail ourselves of classification in the Materia Medica founded on the kind of operation which medicines exert on the human body, because there are seemingly no better characteristics by which to arrange them. But even this method is defective, because few medicines are simple in their operation, and of course most of them have claims to stand in more than one class. As examples, Tobacco, Henbane, Fox-

glove, and Opium are all of them properly placed by authors under the head of Narcotics. But of these, Tobacco is an emetic, Henbane a cathartic, Foxglove a diuretic, and Opium, while it checks all other excretions, is itself sudorific. Mercury, under its different forms and modes of administration, is capable of fulfilling half a dozen different intentions. The classifier of medicines then can do no more than to arrange them by their most obvious and well known properties, whatever these may be, leaving it understood that the name of a class is by no means fully descriptive of the character of its contents.*

In forming a selection of sixty plants to be represented in this work, it has been endeavoured to choose those which are among the most interesting to botanists, at the same time that they possess claims upon the attention of medical men. It is by no means to be asserted that all these possess so decided an efficacy as to entitle them to the rank of standard medicines, or to make it advisable that pharmacopœias should be swelled by their introduction. A part of them no doubt are eminently entitled to this distinction. Others are efficacious only in a second degree,

* For a botanical arrangement of the plants, see the systematic index at the end of the volume.

but are still in use, and often advantageously so, in the hands of country practitioners. There are some of yet inferior efficacy, which, having formerly enjoyed a certain degree of medicinal notoriety, are inserted here with a view of defining their true character.

The progress of botanical students is much facilitated by the possession of correct drawings and dissections of a variety of dissimilar plants. In this country botanical figures, especially of American plants, are scarce, and accessible to but a small number of those who pursue this study. It is hoped that the present work may, in a certain degree, supply the deficiency, at least until the extension of natural science among us, and the increased number of botanical students, shall call forth and support works of greater magnitude.

A part of the plants contained in this work have never been figured in any botanical work. Others have been represented a great number of times ; yet their importance, in a medical point of view, required their admission ; and the figure being always made from an American specimen, it may, on this account, be not destitute of interest.

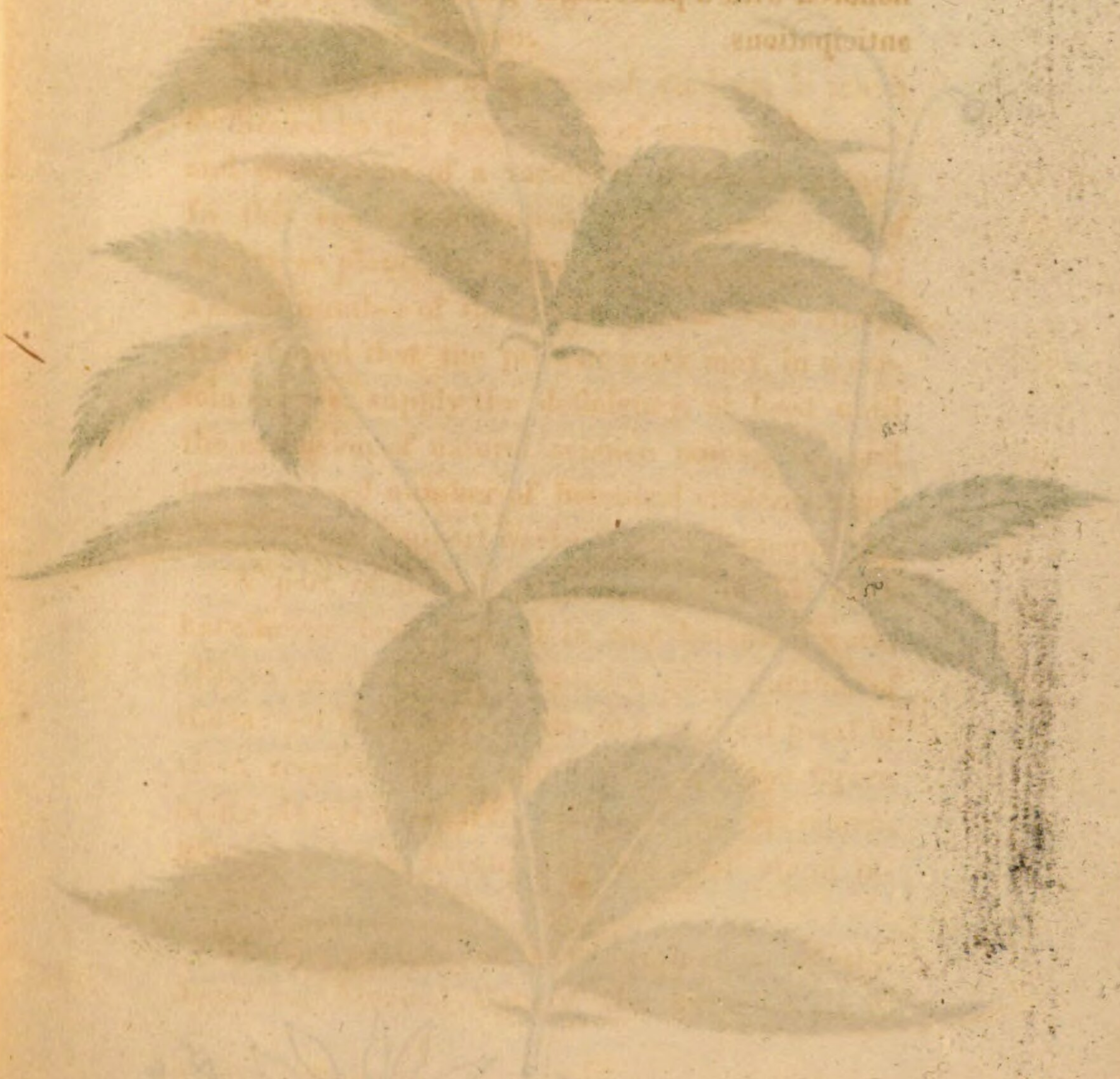
Having arrived at the termination of the American Medical Botany, the author feels it

incumbent on him to state, that he has at no time had cause to regret the undertaking of a work, which has furnished a most interesting employment for his leisure hours ; and which has been honored with a patronage, greatly exceeding his anticipations.

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Phytolacca sp.



Gillenia trifoliata

AMERICAN
MEDICAL BOTANY.

HELENIA TRIFOLIATA.

Common Yellow-flower.

PLATE XII

NOTWITHSTANDING the principle avowed by Linnæus, that genera are formed by nature; the determination of generic consanguinity in species is in many instances one of the greatest perplexities of the botanist. - What difference in structure and external form either of flower or fruit is sufficient to separate families of plants from each other; is a point often difficult to decide; and is perhaps as frequently set at rest by convention and by arbitrary decision, as it is by any reasonable boundaries designated in nature. Hence the species of a vegetable order are exceedingly numerous, and a close similarity persuades the botanist that genera are multiplied by botanists, but the determination of species may be facilitated.



Gillenia trifoliata

AMERICAN

MEDICAL BOTANY.

—

GILLENIA TRIFOLIATA.

Common Gillenia.

—

PLATE XLI.

NOTWITHSTANDING the principle avowed by Linnæus, that genera are formed by nature; the determination of generic consanguinity in species occasions in many instances one of the greatest perplexities of the botanist. What difference in structure and external form either of flower or fruit, is sufficient to separate families of plants from each other; is a point often difficult to decide; and is perhaps as frequently set at rest by convenience and by arbitrary decision, as it is by any unexceptionable boundaries designated in nature. When the species of a vegetable order are exceedingly numerous, and a close similarity pervades the whole; genera are multiplied by botanists, that the discrimination of species may be facilitat-

ed. On the other hand, where a group of species is not unwieldy from its size, or deficient in distinctive marks, the genera are made as comprehensive, as natural affinity will permit. The diversity of structure, which exists in the flowers of *Gentiana*, or the fruit of *Bunias*, would be deemed ample foundation for constructing half a dozen genera among the umbelliferous, leguminous, or gramineous orders. But as the species of the genera above have a strong agreement in one part of their fructification, as well as in general habit, and as no great obscurity or inconvenience results from keeping them together, it has not been thought worth while to multiply nomenclature by arranging them under separate titles.

The separation of *Gillenia* from *Spiræa* is one of those cases, upon which the botanist may hesitate long, without finding reasons strong enough to influence his decision. The natural order to which they belong is remarkable for having its genera well defined, so that there is no necessity for the separation, arising from confusion or indistinctness. The fruit of *Gillenia* is exactly the fruit of *Spiræa*, and the habit of the herb in one is not very foreign from that of the other. There is nevertheless something in the irregular corolla, taken in conjunction with the campanulate calyx,

which I think would prevent any one, at first sight, from considering the plant a *Spiræa*; and which may afford sufficient ground for following the example of Mœnch in considering it a distinct genus.

The *Gillenia trifoliata* grows in woods, in a light soil, from Canada to Florida. In the maritime states I have not met with it north of the Hudson. Its flowering time is in June and July.

The generic character, which distinguishes this plant from *Spiræa*, is as follows: *Calyx campanulate, five toothed; corolla irregular, petals lanceolate, contracted near the claws; capsules five.* The species *trifoliata* has *ternate, lanceolate, serrate leaves, and stipules which are minute, lineal-lanceolate and nearly entire.*

Class *Icosandria*, order *Pentagynia*. Natural orders *Senticosæ*, Lin. *Rosacæ*, Juss.

This plant has commonly a number of stems from the same root, which are a foot or two in height, erect, slender, flexuous, smooth, commonly of a reddish tinge, and considerably branched. The leaves are alternate, trifoliate, with very short petioles, furnished with small lanceolate, slightly toothed stipules at the base. Leaflets ovate, lanceolate, acuminate, sharply toothed, the upper ones often single. The flowers are few in num-

ber, scattered, terminal, nodding, forming a sort of panicle, with long peduncles, occasionally furnished with minute lanceolate bractes. Calyx subcampanulate, or tubular, with the lower half narrowest, the border divided into five reflexed acute teeth. Petals five, the two upper ones separated from the three lower, white, with a reddish tinge on the edge of the outside, lanceolate, unguiculate, contracted, and approximated at base. Stamens about twenty in a double series within the calyx. Germ round, styles approximated. Capsules five, not *one*, as some authors have stated, diverging, oblong, acuminate, gibbous without, sharp edged within, two valved, one celled, one or two seeded ; seeds oblong, corresponding in shape to the capsule.

The root of this plant is much branched and knotty. It consists of a woody portion, invested with a thick bark, which when dry is brittle, and very bitter to the taste. The predominant, soluble ingredients in this root appear to be a bitter extractive matter, and resin. When boiled in water, it imparts to it a beautiful, deep red, wine colour, and an intensely bitter taste. This decoction undergoes no change from alcohol or gelatine, though it gives a precipitate with muriate of tin. Water distilled from the root has its peculiar

flavour, with little of the bitterness. A large portion of resin is precipitated on the addition of water to an alcoholic tincture of the root.

Under the name of *Spiræa trifoliata*, this plant is well known to students of the American Materia Medica, as an emetic. To the remarks which have been made by various writers, I can add my own testimony of its possessing properties in a certain degree analogous to those of ipecacuanha. It requires, however, a larger dose, and I have not been satisfied that it is at all certain in its operation. At times I have known fifteen grains to produce a full operation; at others thirty grains have been given to a person already predisposed to vomit, without producing the least sensible effect.

The best printed account which I have found respecting its mode of operation is contained in an Inaugural Dissertation, published at Philadelphia in 1810, by Dr. De la Motta, then of Charleston, S. C. This gentleman, in addition to other trials, took the root himself twice in sufficient quantity to produce vomiting. "In order," he says, "to ascertain this particular power of the *Spiræa*, I, early in the morning, fasting, prescribed for myself twenty-five grains of the powdered root of this plant. I divided this quantity into four

equal parts, one of which I took every fifteen minutes, conceiving this a sufficient length of time to allow for the action of each dose in my stomach. The first dose taken produced no manifest effect. At the expiration of fifteen minutes I took a second dose ;—a degree of uneasiness was experienced, attended with some nausea ;—at the end of fifteen minutes more I swallowed a third dose,—nausea increased, until the convulsive action of my stomach took place. The fourth dose was now taken ; considerable efforts were made to vomit, and finally the contents of my stomach were thrown up, together with a profuse quantity of bile. The determination of blood to my head, the frequency of my pulse, and heat of my system were much augmented. I now drank half a pint of warm water ; the action of my stomach subsided, and the nausea gradually wore off. A portion of the medicine, I was induced to believe, had insinuated itself into the intestines, as two copious evacuations were produced within the space of three hours. During the day I felt much debilitated, but imputed this to the general effect of emetics.

“ I was thus satisfied with respect to its efficacy as an emetic upon an empty stomach. But, being still desirous of becoming better acquainted with

its particular operation after eating an usual meal, I made a second experiment, one month after the first. In the morning, one hour after I had eaten a hearty breakfast, I took twenty grains of the medicine, in divided doses, as in the former experiment. At the expiration of a very few minutes nausea commenced, which continuing to increase, with very few efforts I discharged the contents of my stomach. The effects of the second trial answered exactly my expectations."

Some authors have attributed a tonic power to the Gillenia, when administered in small doses. That it possesses such a power is rendered probable by its bitter taste, and by the fact, that small doses of ipecacuanha exert a beneficial stimulus on the stomach in certain cases of debility in that organ.

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PLATE XLI.

Fig. 1. *Gillenia trifoliata*.

Fig. 2. *Calyx*.

Fig. 3. *A petal*.

Fig. 4. *Flower opened, shewing the situation of the stamens*.

Fig. 5. *Germ and styles*.

Fig. 6. *Styles separated*.

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Colless, Thobolatus. *Journal of the Royal Society of New South Wales*, 1895, vol. 1, p. 100.

PLATE III

- Fig. 1. *Collessia thobolatus*.
- Fig. 2. *Collessia thobolatus*.
- Fig. 3. *Collessia thobolatus*.
- Fig. 4. *Collessia thobolatus*.
- Fig. 5. *Collessia thobolatus*.
- Fig. 6. *Collessia thobolatus*.



Rhus radicans

RHUS RADICANS.

Poison Ivy.

PLATE XLII.

LIKE the *Rhus vernix*, described in our first volume, this plant is regarded with aversion, and too frequently furnishes cause to be remembered by persons of susceptible constitution, who unwarily become exposed to its poisonous influence. The general recognition of its deleterious character is evinced in the application of the names *Poison vine*, *Poison creeper*, and *Poison Ivy*, which are given to it in all parts of the United States.

The *Rhus radicans* is a pretty common inhabitant of the borders of fields and of woods in most soils which are not very wet. Its mode of growth is much like that of the common creeper, the *Ampelopsis quinquefolia* of Michaux; and like that vine, and the European Ivy, it would doubtless be cultivated for ornament, were



Solanum radicans

RHUS RADICANS.

Poison Ivy.

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it harmless as it is handsome. As its name implies, this vine ascends upon tall objects in its neighbourhood by means of strong lateral rooting fibres, which project in great numbers from its sides, and attach themselves to the bark of trees and the surface of stones. The extreme branches of these fibres appear very strong in proportion to their fineness, and insinuate themselves into the minutest pores and crevices. The adhesion of the vine to the bark of trees is frequently so strong, that it cannot be torn off without breaking, and I have repeatedly seen large stems of the *Rhus* completely buried in the trunks of old trees, the bark having grown over and enveloped them. The fibres are analogous in their structure to fine roots, and consist of a regular wood and bark. They are sometimes thrown out in such numbers on all sides, as to give the vine a shaggy appearance and conceal its bark. In general, however, they tend to the shady side, and are attracted toward opaque objects, furnishing an exemplification of Mr. Knight's beautiful explanation of motion in tendrils, which, by their propensity to avoid the light and approach the shade, are directed into contact with bodies capable of yielding them support.

The size of the stem in this vine is commonly not more than an inch. Sometimes, however, in very old plants, it is found several times as large. It is usually compressed on the side which adheres to the support. In favourable situations it ascends to the tops of the highest rocks and trees, and is often seen restoring to decayed trunks the verdure which they have lost. When it does not meet with an elevated prop, the plant becomes stunted in its growth, is more branched, and affects a spiral mode of growth; or falls to the ground, takes root and rises again.

The genus *Rhus* is placed by Linnæus in the class *Pentandria*, and order *Trigynia*. The present species, however, is diœcious, a fact which is also true of most of the American species of *Rhus* which I have examined. The *Rhoes* belong to the Linnæan natural order *Dumosæ*, and to the *Terebintaceæ* of Jussieu.

The leaves of the *Rhus radicans* are ternate, and grow on long semicylindrical petioles. Leaflets ovate or rhomboidal, acute, smooth and shining on both sides, the veins sometimes a little hairy beneath. The margin is sometimes entire and sometimes variously toothed and lobed, in the same plant. The flowers are small and greenish white. They grow in panicles or

compound racemes on the sides of the new shoots, and are chiefly axillary. The barren flowers have a calyx of five erect, acute segments, and a corolla of five oblong recurved petals. Stamens erect with oblong anthers. In the centre is a rudiment of a style.—The fertile flowers, situated on a different plant, are about half the size of the preceding. The calyx and corolla are similar but more erect. They have five small, abortive stamens and a roundish germ surmounted with a short, erect style, ending in three stigmas. The berries are roundish and of a pale green colour, approaching to white.

A plant has long appeared in the Pharmacopœias under the name of *Rhus toxicodendron*. Botanists are not agreed whether this plant is a separate species from the one under consideration, or whether they are varieties of the same. Linnæus made them different with the distinction of the leaves being naked and entire in *Rhus radicans*, while they are pubescent and angular in *Rhus toxicodendron*. Michaux and Pursh, whose opportunities of observation have been more extensive, consider the two as mere local varieties; while Elliott and Nuttall still hold them to be distinct species. Among the plants which grow abundantly around Boston, I have

frequently observed individual shoots from the same stock having the characters of both varieties. I have also observed that young plants of *Rhus radicans* frequently do not put out rooting fibres until they are several years old, and that they seem, in this respect, to be considerably influenced by the contiguity of supporting objects.

The wood of the Poison Ivy is brittle, fine grained and white, with a yellow heart in the old plants.

If a leaf or stem of this plant be broken off, a yellowish milky juice immediately exudes from the wounded extremity. After a short exposure to the air, it becomes of a deep black colour and does not again change. This juice, when applied to linen, forms one of the most perfect kinds of indelible ink. It does not fade from age, washing, or exposure to any of the common chemical agents. I have repeatedly, when in the country, marked my wristband with spots of this juice. The stain was at first faint and hardly perceptible, but in fifteen minutes it became black, and was never afterwards eradicated by washing, but continued to grow darker as long as the linen lasted.

Dr. Thomas Horsfield, in his valuable dissertation on the American species of *Rhus*, made

various unsuccessful experiments with a view to ascertain the nature of this colouring principle, and the means of fixing it on stuffs. He found that the juice, expressed from the pounded leaves, did not produce the black colour, and that strong decoctions of the plant, impregnated with various chemical mordants, produced nothing more than a dull yellow, brownish or fawn colour. The reason of this is, that the colouring principle resides not in the sap, but in the *succus proprius* or peculiar juice of the plant, that this juice exists only in small quantity, and is wholly insoluble in water, a circumstance which contributes to the permanency of its colour, at the same time that it renders some other medium necessary for its solution.

With a view to ascertain the proper menstruum for this black substance, I subjected bits of cloth stained with it, to the action of various chemical agents. Water, at various temperatures assisted by soap and alkali, produced no change in its colour. Alcohol, both cold and boiling, was equally ineffectual. A portion of the cloth, digested several hours in cold ether with occasional agitation, was hardly altered in appearance. Sulphuric acid reddened the spots, but scarcely rendered them fainter. The fumes of oxymuriatic

acid which bleached vegetable leaves and bits of calico in the same vessel, exerted no effect on this colour.

Boiling ether is the proper solvent of this juice. A piece of linen spotted with the *Rhus* was immersed in ether and placed over a lamp. As soon as the fluid boiled, the spot began to grow fainter, and in a few minutes was wholly discharged, the ether acquiring from it a dark colour. The linen at the same time became tinged throughout with a pale greyish colour, acquired from the solution.

This nigrescent juice, in common with that of the *Rhus vernix*, has, perhaps, claims to be considered a distinct proximate principle in vegetable chemistry.

The leaves and bark are astringent to the taste, which quality appears to be occasioned by gallic acid rather than tannin. The infusion and decoction become black on the addition of salts of iron, but discover hardly any sensibility to gelatin.

A poisonous quality exists in the juice and effluvium of this plant, like that which is found in the *Rhus vernix* already described. It is said, that some other species of *Rhus*, such as *Rhus pumilum* and *Rhus typhinum*, possess the same

property in a greater or less degree. The poison Ivy, however, appears to be less frequently injurious than the poison Dogwood, and many persons can come in contact with the former with impunity, who are soon affected by the latter. I have never, in my own person, been affected by handling or chewing the *Rhus radicans*, though the *Rhus vernix* has often occasioned a slight eruption. Indeed, the former plant is so commonly diffused by road-sides and near habitations, that its ill consequences must be extremely frequent, were many individuals susceptible of its poison.

Those persons who are constitutionally liable to the influence of this poison, experience from it a train of symptoms very similar to those which result from exposure to the *Rhus vernix*. These consist in itching, redness and tumefaction of the affected parts, particularly of the face; succeeded by blisters, suppuration, aggravated swelling, heat, pain, and fever. When the disease is at its height, the skin becomes covered with a crust, and the swelling is so great as in many instances to close the eyes and almost obliterate the features of the face. The symptoms begin in a few hours after the exposure, and are commonly at the height on the fourth or fifth day; after which, desquamation begins to take place, and the distress, in most instances, to diminish.

Sometimes the eruption is less general, and confines itself to the part which has been exposed to contact with the poison. A gentleman, with whom I was in company, marked his wristband with the fresh juice, to observe the effect of the colour. The next day his arm was covered with an eruption from the wrist to the shoulder, but the disease did not extend further. It sometimes happens that the eruption continues for a longer time than that which has been stated, and that one set of vesications succeeds another, so as to protract the disease beyond the usual period of recovery.

The symptoms of this malady, though often highly distressing, are rarely fatal. I have nevertheless been told of cases in which death appeared to be the consequence of this poison.

The disease brought on by the different species of *Rhus* appears to be of an erysipelatous nature. It is to be treated by the means which resist inflammation, such as rest, low diet, and evacuations. Purging with the neutral salts is peculiarly useful, and in the case of plethoric constitutions, or where the fever and arterial excitement are very great, blood-letting has been found of service.

The extreme irritability and burning sensation may be greatly mitigated by opium. Cold

applications, in the form of ice or cold water, are strongly recommended by Dr. Horsefield in his treatise, and when persevered in, they appear to exert a remarkably beneficial effect. The acetate of lead is perhaps as useful as any external palliative, and it should be used in solution rather than in the ointment, that it may be applied as cold as possible. The late Dr. Barton speaks highly of a solution of corrosive sublimate externally applied in this disease, but from trials of the two remedies made at the same time and in the same patient, I have found the lead the more beneficial of the two.

A person who has been in contact with the Rhus and finds himself poisoned, should immediately examine his hands, clothes, &c. to see if there are no spots of the juice adhering to him. These, if present, should be removed, as they will otherwise serve to keep up and extend the disorder. From a want of this precaution, the disease is frequently transferred from the hands to different parts of the body, and likewise kept up for a longer time than if the cause had been early removed. As washing does not eradicate the stains of this very adhesive juice, it is best to rub them off with some absorbent powder.

The *Rhus radicans* has been administered internally in certain diseases by a few practitioners in Europe and America. Dr. Horsefield, in several instances, administered a strong infusion in the dose of about a teacup full to consumptive and anasarcaous patients. It appeared to act as an immediate stimulant to the stomach, producing some uneasiness in that organ, also promoting perspiration and diuresis. Some practitioners in the Middle States, we are told by the same author, have exhibited it with supposed benefit in pulmonary consumption. A French physician, Du Fresnoy, has reported seven cases of obstinate herpetic eruption, which were cured by the preparations of this plant. His attention was drawn to the subject by finding that a young man who had a *dartre* upon his wrist of six years' standing, was cured of it by accidentally becoming poisoned with this plant. The same physician administered the extract in several cases of palsy, four of which, he says, were cured by it.

Dr. Alderson, of Hull, in England, gave the *Rhus toxicodendron* in doses of half a grain, or a grain three times a day, in several cases of paralysis; and states, that all his patients recovered, to a certain degree, the use of their limbs.

The first symptom of amendment was an unpleasant feeling of prickling or twitching in the paralytic limbs. Dr. Duncan, author of the Edinburgh Dispensatory, states, that he had given it in larger doses without experiencing the same success, although he thinks it not inactive as a medicine.

My own opinion is, that the plant under consideration is too uncertain and hazardous to be employed in medicine, or kept in apothecaries' shops. It is true, that not more than one person in ten is probably susceptible of poison from it. Yet, even this chance, small as it is, should deter us from employing it. In persons not constitutionally susceptible of the eruptive disease, it is probably an inert medicine, since we find that Du Fresnoy's patients sometimes carried the dose as high as an ounce of the extract, three times a day, without perceiving any effect from it.

It is true that the external application of the *Rhus radicans* and *Rhus vernix* would, in certain cases, afford a more violent external stimulus, than any medicinal substance with which we are acquainted. But since it is neither certain in its effect, nor manageable in its extent, the prospect of benefit, even in diseases like palsy and mania, is not sufficient to justify the risk of great evil.

BOTANICAL REFERENCES.

Rhus radicans, WILLD. *Sp. pl.* i. 1481.—ELLIOTT, i.—*Rhus toxicodendron*, &c. MICHAUX, *Flor.* i. 183.—PURSH, i. 205.—*Toxicodendron rectum* &c.—DILLENIIUS, *Elth. t.* 291.

MEDICAL REFERENCES.

DU FRESNOY, quoted in *Annals of Medicine*, iv. 182.—v. 483.—*Med. and Phys. Journal*, i. 308.—vi. 273.—x. 486.—DUNCAN, *Dispens.* 294.—HORSEFIELD, *Dissertation*, Philad. 1798.

PLATE XLII.

Fig. 1. *Rhus radicans*, the barren plant in flower,

Fig. 2. Fruit.

Fig. 3. Barren flower.

Fig. 4. Fertile flower.

Fig. 5. Petal.

Fig. 6. Stamens and rudiment of a style in the barren flower,

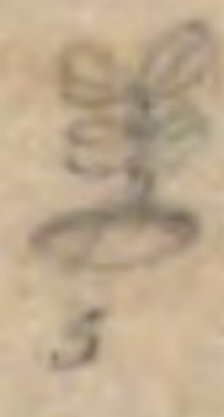
Fig. 7. Germ, style and abortive stamens in the fertile flower.

MYRICA CERIFERA.

Wax Myrtle.

PLATE XLIII.

ALMOST every region of the United States produces varieties of the Wax myrtle. Michaux considers them all as belonging to one species, a conclusion which is warranted by the great number of intermediate sizes, and forms of leaf, which may be observed between the different extremes. Pursh, however, has chosen to distinguish three species which bear wax, and which he names *cerifera* after Linnæus, *Caroliniensis* from Willdenow, and *Pennsylvanica* from Lamarck. The *Wax myrtle* or *Bayberry*, as it is often called, which is common in New England, varies in height from one to seven or eight feet. It is found in every kind of soil from the borders of swamps to the tops of barren hills, and is very much influenced in its size and appearance, by the place in which it happens to grow.



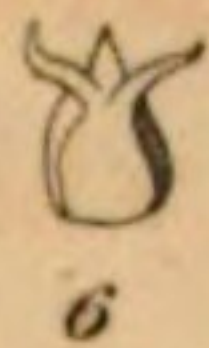
Myrica cerifera

WAX MYRTLE.

Wax Myrtle.

PLATE 52.

As in every region of the United States, numerous varieties of this tree are found, and we consider them all as belonging to one species, or variety, which is warranted by the great number of intermediate forms, and the fact that the same tree is observed between the different extremes. Smith, however, has chosen to distinguish three species which bear wax, and which he names *virginica* after Lamarek, *Carolinensis* from Willdenow, and *Pennsylvanica* from Lamarek. The *Wax myrtle*, or *Bayberry*, as it is often called, which is common in New England, grows to height from one to seven or eight feet. It is found in every kind of soil from the bottom of swamps to the tops of barren hills, and is much influenced in its size and appearance by the place in which it happens to grow.



Myrica cerifera

The genus *Myrica* belongs to the class Dicotyledonae and order Myricales. It is also ranked among the members of the family Myricaceae. The generic character consists in an achenial fruit, the seeds without a corolla; the barren flowers containing four anthers, the fertile ones two stigmas. Fruit, one seeded. The specific character as given by Michx. is as follows. Leaves narrow-lanceolate, with a few serratures at the margins. Fruit spherical, green, distinct.

The *Wax myrtle* is found bearing fruit at every size, from the height of one foot to six or eight. In Louisiana it is said to grow to twelve feet. The top is much branched, and covered with a grayish bark. The leaves are wedge-lanceolate, varying in width, sometimes entire, but more frequently toothed, particularly toward the end. They are somewhat pubescent, a little paler beneath, and generally twisted, or revolute in their mode of growth. They are inserted in a scattered manner by short petioles. The flowers appear in May before the leaves are fully expanded. The barren ones grow in cymes, which are sessile, erect, about half an inch or three quarters long; originating from the sides of the last year's twigs. Every flower is formed by a

The genus *Myrica* belongs to the class *Diæcia* and order *Tetrandria*. It is also ranked among the *Amentaceæ* of Linnæus and Jussieu.

The generic character consists in an *imbri-cated ament*; *the scales without a corolla*; *the barren flowers containing four anthers, the fertile ones two styles*. *Fruit, one seeded*.—The specific character, as given by Michaux, is as follows. *Leaves wedge-lanceolate, with a few serratures at top*; *barren aments lax*; *fruit spherical, naked, distinct*.

The Wax myrtle is found bearing fruit at every size, from the height of one foot, to six or eight. In Louisiana, it is said to grow to twelve feet. The top is much branched, and covered with a grayish bark. The leaves are wedge-lanceolate, varying in width, sometimes entire, but more frequently toothed, particularly toward the end. They are somewhat pubescent, a little paler beneath, and generally twisted, or revolute in their mode of growth. They are inserted in a scattered manner by short petioles. The flowers appear in May before the leaves are fully expanded. The barren ones grow in catkins, which are sessile, erect, about half an inch or three quarters long; originating from the sides of the last year's twigs. Every flower is formed by a

concave rhomboidal scale, containing three or four pairs of roundish anthers on a branched footstalk. The fertile flowers, which grow on a different shrub, are less than half the size of the barren ones, and consist of narrower scales, with each an ovate germ, and two filiform styles.

To these aments succeed clusters or aggregations of small globular fruits resembling berries, which are at first green, but finally become nearly white. They consist of a hard stone inclosing a dicotyledonous kernel. This stone is studded on its outside with small black grains resembling fine gun-powder, over which is a crust of dry white wax, fitted to the grains and giving the surface of the fruit a granulated appearance. Botanically speaking, this fruit has been improperly called a berry, and a drupe; since it is always dry and never invested with a cuticle, or any thing but the grains and wax.

Every young part of the Wax myrtle has a fragrant, balsamic smell, which it communicates to the fingers when rubbed by them. This appears to be derived from a resinous exudation, which may be seen in minute points of a bright transparent yellow, covering the young shoots and under surface of the leaves. In the berries this resinous substance is within the wax.

The bark and leaves of the *Myrica cerifera* contain gallic acid, tannin, resin, and a small quantity of mucilage, which are manifested by their usual tests.

The wax of the *Myrica* is obtained for common purposes by boiling large quantities of the berries in kettles with water enough to cover them to the depth of several inches. The berries, which float at first, gradually subside to the bottom when the wax is melted off, which latter substance floats on the surface. When the boiling has been continued long enough to divest the berries of most of their wax, the liquid is suffered to cool, and the wax concretes on the top. It is purified by melting it anew, and is then cast into masses.

In this state it is of a greenish gray colour, with a consistence which is intermediate between that of bees wax and tallow, being brittle and not remarkable for adhesiveness or unctuousity. It burns with a white flame, which is less vivid than that of tallow or whale oil.

The chemical properties of this wax have been examined by M. Cadet, in France, and Dr. Bostock, in England. From their experiments, we learn that water has no action on the Myrtle wax, either cold or at the boiling heat. Dr.

Bostock informs us that alcohol, at the ordinary temperature of the atmosphere, has no action upon it; but one hundred parts by weight of the fluid, when boiling, dissolve about five parts of the wax. About four fifths of this is deposited by cooling, and the rest is slowly deposited in a few days, or may be precipitated by water. Of the mass of wax, a certain portion remains insoluble in alcohol.

Sulphuric ether, according to Dr. Bostock, dissolves but little of the wax, when cold, but acts upon it rapidly, when boiling, taking up somewhat more than one quarter of its own weight. Upon evaporation, the wax is deposited in a crystalline or lamellated form, its texture resembling that of spermaceti.—Rectified oil of turpentine, when assisted by heat, dissolves about six per cent of its own weight, most of which is deposited on cooling.—Pure potash, in water, renders the wax colourless by boiling, and forms a soap with a small part, which may be decomposed by an acid, and affords the wax nearly unchanged.—The sulphuric acid, assisted by heat, dissolves about one twelfth of its own weight, and forms a dark brown mass. The nitric and muriatic acids exert very little action upon it. Dr. Bostock considers the Myrtle wax to be a fixed vegetable oil, rendered concrete by oxygen.

M. Cadet, in addition to many of the above characteristics of Myrtle wax, found that it combined readily with the semivitreous oxyde of lead, forming a very hard plaister. When distilled in a retort, the wax was partly decomposed, and a portion which passed over was white and of a soft consistence. Oxygenated muriatic acid bleaches it, but with more difficulty than bees wax.

The experiments which I have made on this substance confirm the preceding statements with the following exceptions. Cold alcohol dissolves a minute portion, which is gradually separated by the addition of water, and floats in perceptible *floci*, near the surface. Cold ether dissolves about one sixteenth of its weight. This it does with great rapidity, and if thin shavings of the wax be dropped into a vessel of ether, they disappear almost immediately.

Dr. J. F. Dana has published, in Silliman's Journal, an account of some experiments made to ascertain the proportion of wax, and of the other parts which compose the entire berry. He found the wax to constitute nearly a third of the whole, or thirty two per cent; the kernels 47.00, the black powder 15.00, with about 5.00 of a resino-extractive matter,

There undoubtedly exists, in the berries of this shrub, some interesting constituents beside the wax and insoluble portions, as the following results will show. If water be distilled from the fresh berries, it acquires a slight pearly appearance and a fine aromatic odour and taste. This indicates the presence of a volatile oil, though I have not performed the experiment sufficiently in the large way to obtain any oil separate. The decoction remaining in the retort gives proofs of gallic acid.

When the wax, in a separate state, is boiled in alcohol, a portion is dissolved, which is mostly deposited on cooling, leaving the fluid clear. But if alcohol be boiled upon the berries till a strong solution is formed, it does not give a deposit on cooling, but the solution coagulates into a soft solid and remains afterwards unaltered. This coagulum is readily soluble in cold ether, and melts when exposed to heat. If the berries be boiled in water until the wax is melted and principally detached, the remaining parts still give a coagulating solution with alcohol.—The tincture made by digesting cold alcohol on the bruised berries is considerably coloured, and becomes turbid on the addition of water, but whether the resinous substance thus precipitated

is the same in small quantity, which produces the coagulation in a large one ; I am not prepared to say.

It appears, then, that there exists in the berries of the *Myrica* a peculiar vegetable principle, bearing nearly the same relation to alcohol, as starch and gelatin do to water. I have not yet obtained it in a separate state, and cannot therefore give any additional characteristics to those which have been already stated.

The Myrtle wax is useful for many of the purposes for which bees wax and tallow are employed, particularly for candles. It burns with a clear flame, though less vivid than that of common oil, and emits a considerable fragrance. It was formerly much in demand as an ingredient in a species of blacking ball, to which it communicated a temporary lustre and power of repelling water. It has occasionally been used in pharmacy in various compositions intended for external use, and is mild or stimulating according as it is more or less pure and freed from the colouring matter.

In some parts of Europe plantations of this shrub have been raised with a view to the profit to be derived from the wax. In this country, where the shrub abounds, the berries are often

neglected, their collection and the separation of the wax being deemed too laborious to compensate the trouble.

In Dr. Thatcher's Dispensatory, we are informed, on the authority of Dr. Mann, that the bark of the root of the *Myrica cerifera* is emetic. With a view to examining thoroughly its medicinal properties, Dr. S. L. Dana, in 1818, made it the subject of an inaugural dissertation. He found that the powdered bark was acrid and astringent, but did not appear to possess any other qualities than were attributable to those two. Moderate doses of the powder and decoction produced no effect on the stomach or bowels. Large doses, for instance two scruples, were swallowed with difficulty on account of their acrimony, and occasioned heat and nausea at the stomach. Larger doses, of a drachm, produced a powerful burning sensation and vomiting. Costiveness generally followed the use of this medicine. The powder, when snuffed up the nose, proved powerfully sternutatory, and when applied to the fungous granulations of an ulcerated leg, it produced so much pain as compelled the patient to wash it off.

We may then consider the bark of the *Myrica* as an acrid stimulant and astringent. That it

sometimes proves emetic, in large doses, is to be explained in the same way as the operation of mustard and horse-radish, which some of the older physicians employed as emetics. When the stomach is burdened with an undue quantity of stimulus, it naturally tends to relieve itself by vomiting.

On the whole, we are to esteem the *Myrica cerifera* as more interesting in a chemical, than a medical point of view. The pleasant aroma of the water distilled from the berries, and the application of the wax to some purposes of pharmacy, are all, that this shrub at present offers, much deserving the attention of physicians.

BOTANICAL REFERENCES.

Myrica cerifera, WILLD. iv. 745.—MICHAX, ii. 227.—PURSH, ii. 620.—*Myrtus foliis lanceolatis*, &c.—GRONOVIVS, 155.—*Myrtus brabanticae similis*, &c.—CATESBY, i. 13?

MEDICAL AND CHEMICAL REFERENCES.

CADET, translated in *Nicholson's Journal*, 8vo. vol. iv. 187.—BOSTOCK, in ditto, 129.—KALM, *Travels*, i, 129.—DANA, in *Silliman's Journal*, vol. i.—THACHER, *Disp.* 288.

PLATE XLIII.

- Fig. 1. *Myrica cerifera*, with fruit not fully ripe.
Fig. 2. A barren branch in flower.
Fig. 3. Fertile ditto in flower.
Fig. 4. A barren flower.
Fig. 5. The same with the scale turned down, shewing the mode
of growth of the anthers.
Fig. 6. Fertile flower.
Fig. 7. Fruit somewhat magnified.



Juniperus communis

JUNIPERUS COMMUNIS

The peculiar variety of the European Juniper is so peculiar in its mode of growth, that it has never before been considered a distinct species. On comparing it, however, with European specimens, I find the similarity so great, that I do not see sufficient grounds for separating it, especially as there are a few very marked varieties in size and mode of growth, which are not recognized as separate species. The only one I have seen with me in the Western States, is a large trailing shrub, constantly throwing out roots from its branches, and spreading in all directions until it forms beds, which are many rods in circumference. In this way it continues to advance outward, supporting itself by new roots even after the original trunks, at the centre,

* Very beautiful drawings, from which this and the following plate are engraved, were sent me by a lady in Hampshire county.



Juniperus communis

JUNIPERUS COMMUNIS.

Common Juniper.

=
— PLATE XLIV.*

THE prostrate variety of the common Juniper is so peculiar in its mode of growth, that it has some claims to be considered a distinct species. On comparing it, however, with European specimens, I find the similarity so great, that I do not see sufficient grounds for separating it, especially as there are, in Europe, several varieties in size and mode of growth, which are not recognized as separate species. The variety, which is the only one I have met with in the Northern States, is a large trailing shrub, continually throwing out roots from its branches, and spreading in all directions until it forms beds, which are many rods in circumference. In this way it continues to advance outward, supporting itself by new roots even after the original trunks, at the centre,

* Very beautiful drawings, from which this and the following plate are engraved, were sent me by a lady in Hampshire county.

are dead and decayed. It seldom rises more than two or three feet from the ground.

The genus *Juniperus* belongs to the class *Diœcia*, order *Monadelphica*, and natural order *Coniferæ* of Linnæus and Jussieu. It is distinguished by an *ovate ament with peltate scales, which, in the barren flowers, are whorled in threes, with from two to four anthers; in the fertile ones opposite. Berry three seeded.*—In the common Juniper, the leaves are *ternate, spreading, mucronate, larger than the berry.*

The Juniper is with us always a shrub, never rising into a tree. The tips of the branches are smooth and angular. The leaves grow in threes and are linear-acerose, sharply mucronate, shining green on their lower surface, but with a broad glaucous line through the centre of the upper. These leaves, however, are always resupinate, and turn their upper surface toward the ground. The barren flowers grow in small axillary aments, with roundish, acute, stipitate scales, inclosing several anthers. The fertile flowers, growing on a separate shrub, have a small, three parted calyx growing to the germ; and three styles. The fruit is a fleshy, roundish, oblong berry, of a dark purplish colour, formed of the germ and confluent calyx, marked with three prominences or

vesicles at top, and containing three seeds. It requires two seasons to arrive at maturity from the flower.

The leaves of the Juniper have a strong and rather unpleasant taste, with a little astringency. The peculiar juice of the bark appears to consist of resin and volatile oil. Gum Sandarach, which furnishes the material of pounce, is obtained from the European Juniper, from which it exudes spontaneously through crevices and perforations in the bark.

The part principally used in medicine is the berries. These have a strong peculiar taste, accompanied with considerable sweetness. When long chewed, they leave an impression of bitterness. The sweetness appears to reside in the pulp, the bitterness in the seeds, or in their immediate investment, and the aromatic flavour in the essential oil. Dr. Lewis observes, that tinctures, made with these berries, differ according as they are prepared with the berries entire or bruised.

When of a good quality these berries yield, in distillation, a large quantity of pungent, volatile oil of a peculiar flavour, the same which it communicates to gin. The medicinal powers, for which this article is employed, may be considered as residing in this oil.

The berries of the Juniper have long been employed for the purposes of a diuretic, particularly in dropsy. Many of the older writers, whose names are of high authority in medicine, have given favorable reports of the operation of this medicine in hydropic cases. It has been used in substance, in infusion, and in various compound medicines. The effects of its most popular preparation, that of an ardent spirit, are too universally known to require particular elucidation. In addition to the specific effect of the essential oil, some physicians have attributed virtues to the rob, or inspissated decoction of the berries. Hoffman found it of great use in debility of the stomach and intestines, particularly in old people. The stronger preparations have been found useful in uterine obstructions, and in paralytic affections of the vesica urinaria.

Linnaeus informs us, in his *Flora Lapponica*, that a fermented decoction of Juniper berries is used in Sweden as a common drink, but he denies the infusion being substituted for tea and coffee, as some writers have stated, in Lapland. Woodville and others have misquoted him on this point.

The American Juniper berries are considerably inferior to the European in strength and

flavour. The best of the latter are said to be from Italy. But of the imported specimens, which I have examined at the druggists' shops in this country, very few possess any remains of the original strength, and much the greater portion of them appear to have undergone at least one distillation, before their exportation from Europe. The best Juniper berries have a strong impregnation of volatile oil, which, having been once tasted, cannot be easily mistaken. Those which have been subjected to distillation are dry and tasteless.

BOTANICAL REFERENCES.

Juniperus communis, LINN.—SMITH, *Flor. Brit.* iii. 1085.—*Engl. Bot. t.* 1100.—WOODVILLE, ii. *t.* 95.—MICHAX, ii. 245.—PURSH, ii. 646.—BLACKWELL, *t.* 187.

MEDICAL REFERENCES.

MURRAY, *App. Med.* i. 34.—LEWIS, *Disp.* 240.—LINNÆUS, *Flora Lapp.* 376.—WOODVILLE, *ut supra.*

PLATE XLIV.

Fig. 1. *A branch of Juniperus communis in fruit.*

Fig. 2. *A barren twig in flower.*

Fig. 3. *Barren ament.*

Fig. 4. *Scale of anthers of the same.*

Fig. 5. *Fertile flower.*



Juniperus virginiana

JUNIPERUS VIRGINIANA.

Red Cedar.

PLATE XLV.

UNLIKE the subject of the preceding article, this species rises into a tree of considerable size. It is the largest of the Junipers growing within the original limits of the United States, though it appears that Lewis and Clarke brought home specimens of a lofty tree, with foliage resembling the *Juniper*, found on the banks of streams among the Rocky mountains, and which is supposed to be the same with *J. excelsa*, growing in Siberia.

Michaux, in his *North American Sylva*, informs us, that it is found from Maine and from Lake Champlain, without interruption to the State of Florida. In the Middle and Northern states, it frequents the most barren soils, being found in abundance upon dry, rocky hills, where scarcely any other tree can subsist. Its size, however, is said to be here inferior to that which it attains in Virginia, and farther south.



Juniperus virginiana

JUNIPERUS VIRGINIANA.*Red Cedar.***PLATE XLV.**

UNLIKE the subject of the preceding article, this species rises into a tree of considerable size. It is the largest of the Junipers growing within the original limits of the United States, though it appears that Lewis and Clarke brought home specimens of a lofty tree, with foliage resembling the Savin, found on the banks of streams among the Rocky mountains, and which is supposed to be the same with *J. excelsa*, growing in Siberia.

Michaux, in his North American Sylva, informs us, that it is found from Maine and from Lake Champlain, without interruption to the Cape of Florida. In the Middle and Northern states, it frequents the most barren soils, being found in abundance upon dry, rocky hills, where scarcely any other tree can subsist. Its size, however, is said to be here inferior to that which it attains in Virginia, and farther south.

Its habit and foliage abundantly distinguish it from the species in the last article. From the *Juniperus Sabina*, or common Savin of Europe, its botanical distinction is by no means easy. The general appearance and arrangement of the leaves in the full grown specimens of both is precisely the same, except that in the Red cedar the leaves are shorter and more compactly imbricated, having an ovate form, while in the Savin they are somewhat longer and more remote, and may be called lanceolate. In the Red cedar they are also more universally and pungently acute. The characters of the latter species, which I have seen given by different botanists, are almost all defective, in ascribing to it ternate leaves, which, I believe, never exist except in imperfect or distorted specimens. Its more true character is as follows. *Trunk arboreous, upper leaves imbricated in four rows, ovate, pungently acute.* It is by no means certain that on mature examination all the present species of Juniper will be found sufficiently distinct to be kept separate.

The Red cedar, when full grown, is a middling sized tree, though, on account of the value of its wood, it is seldom suffered to reach its full dimensions. The trunk is straight and decreases rapidly

from the ground, giving off many horizontal branches. Its surface is generally unequal, and disfigured by knots, and the crevices and protuberances they occasion. The small twigs are covered with minute, densely imbricated leaves, which continue to increase in size as the branch grows, till they are broken up and confounded with the rough bark. These leaves are fleshy, ovate, concave, rigidly acute, marked with a small depressed gland on the middle of their outer side, growing in pairs, which are united at base to each other, and to the pairs above and below them. They do not alter their situation, but continue opposite till they are obliterated by age. A singular variety sometimes appears in the young shoots, especially those which issue from the base of the trees. This consists in an elongation of the leaves to five or six times their usual length, while they become spreading, acrose, considerably remote from each other, and irregular in their insertion, being either opposite or ternate. These shoots are so dissimilar to the parent tree that they have repeatedly been mistaken for individuals of a different species.—The barren flowers grow in small oblong aments, formed by peltate scales with the anthers concealed within them. The fertile flowers have a proper perianth, which

coalesces with the germ and forms a small roundish berry, with two or three seeds, covered on its outer surface with a bright blue powder.

The leaves of the Red cedar have a strong disagreeable taste, with some pungency and bitterness. The peculiar taste and odour reside, no doubt, in a volatile oil, which, however, is not readily separated by distillations in a small way. The tincture becomes turbid when water is added, and very much so if suffered to stand a day or two. The presence of tannin is developed by the admixture of dissolved isinglass, with a decoction of the bark and leaves.

The botanical similarity of this tree to the *Savin*, which is an European shrub, has already been mentioned. In their sensible and medicinal properties, they are equally allied. The taste of the two species is nearly the same, except that the cedar leaves are the more nauseous of the two. As the American tree is frequently known throughout the country by the name of *Savin*, our apothecaries have been led to presume upon its identity with that medicine, and it has long been used in cases where the true *Savin* is recommended. Its most frequent use, however, is in the composition of the cerate employed for keeping up the irritation and discharge of blisters.

This preparation is the same with the Savin cerate, used in Europe, the leaves of the Red cedar being substituted for those of the Savin. When properly prepared by boiling the fresh leaves for a short time in about twice their weight of lard with the addition of a little wax, a cerate is formed of peculiar efficacy as a perpetual epispastic. When applied as a dressing to a newly vesicated surface, and afterwards repeated twice a day, it rarely fails to keep up the discharge for an indefinite length of time. Under its operation, the discharge usually changes from a serous to a puriform appearance, and concretes upon the surface; so that it requires to be removed from time to time, to admit the full action of the cerate.

Internally the leaves of the *Juniperus Virginiana* have been found to exert effects very similar to those of the Savin. They have proved useful as an emmenagogue, and as a general stimulant and diaphoretic in rheumatism. They have also had some reputation as a diuretic in dropsy.

The wood of the Red cedar is smooth, light, and very durable. Its alburnum is white, but the heart wood of a beautiful red colour, whence its name is derived. It is principally employed for posts in fences, in which capacity it proves

more durable than almost any species of wood used for the same purpose.

BOTANICAL REFERENCES.

Juniperus Virginiana, Willd. iv. 862.—Pursh, ii. 647.—Michaux, *fl. N. A. Sylva*, t. 155.

MEDICAL REFERENCE.

Thacher, *Disp.* 247.

PLATE XLV.

Fig. 1. *Juniperus Virginiana* in fruit.

Fig. 2. Variety with long leaves.

Fig. 3. Barren branch in flower.

Fig. 4. Barren ament magnified.

Fig. 5. Scale and anthers.

more durable than almost any species of wood
used for the same purpose.

BOTANICAL DESCRIPTION.

Juniperus Virginiana, Willd. in 1805, Prodr. 4, 311.
Rostk. Sch. 1, 135.

MEDICAL REFERENCE.

London Disp. 21.

PLATE XII.

- Fig. 1. Juniperus Virginiana in fruit.
- Fig. 2. Branch with long leaves.
- Fig. 3. Shorter branch in flower.
- Fig. 4. Berries on a short branch.
- Fig. 5. Scale and needle.



Menyanthes trifoliata

MENYANTHES TRIFOLIATA.

Black Bean.

PLATE XLVI

The *Black bean* or *Marsh Trefoil* is one of those plants which are native in Europe and North America, with so little difference of structure, in the two continents, that their specific identity can hardly be doubted. I have compared specimens of the native, and foreign plant, without being able to perceive the least definable difference, except in size; the American being smaller. Yet, if we admit the statements of botanical writers, the plant flowers in England at least a month later than it does in the neighbourhood of Boston, a circumstance not usual in other species of vegetables.

The most spongy and boggy soils, which are inundated at certain seasons, and never wholly destitute of water, are the favorite situations of the *Menyanthes trifoliata*. It often constitutes large

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The most spongy and boggy soils, which are inundated at certain seasons, and never wholly destitute of water, are the favorite situations of the *Menyanthes trifoliata*. It often constitutes large

beds at the margin of ponds and brooks. It is common in New England, and grows, according to Pursh, as far south as Virginia.

The genus *Menyanthes* has its *corolla hairy on the upper side; stigma bifid; capsule one celled, two valved*. The species in the present article is named from its *ternate leaves*. Class *Pentandria*. Order *Monogynia*. Natural orders *Rotaceæ*, Lin. *Gentianæ*, Juss.

The root of this plant penetrates horizontally in the bog-earth to a great distance. It is regularly intersected with joints at the distance of about half an inch from each other, these joints being formed by the breaking off of the old petioles and their sheaths. The leaves proceed from the end of the root on long stalks furnished with broad sheathing stipules at base. They are trifoliate, nearly oval, glabrous, somewhat fleshy, and slightly repand, or furnished with many irregularities at the edge, which hardly prevent them from being entire. The scape is round, ascending and smooth, bearing a conical raceme of flowers. Peduncles straight, scattered, supported by ovate concave bractes. Calyx erect, subcampanulate, five parted, persistent. Corolla funnel shaped, the tube short, the border five cleft, spreading and at length revolute, clothed on

the upper part with a coating of dense, fleshy, obtuse fibres. The colour, in the American variety, is generally white, with a tinge of red, particularly on the outside. Stamens five, shorter than the corolla, and alternate with its segments; the anthers oblong-arrow shaped. Germ ovate; style cylindrical, persistent, as long as the corolla; stigma bifid, compressed. Capsule ovate, two valved, one celled. Seeds numerous, minute, attached to two lateral receptacles.

In New England this plant flowers about the middle of May.

The whole plant and particularly the root has an intensely bitter taste, hardly exceeded by that of Gentian and Columbo. This bitterness resides chiefly in an extractive matter, soluble in water and spirit. The root is, however, resinous and impregnates alcohol more strongly than water, and may be precipitated from its tincture, in part, by the latter fluid.

The root of this vegetable is undoubtedly entitled to a high place in the list of tonics. In Europe it has long been admitted to a place in the Materia Medica, and has received the commendations of various physicians. When given in small doses, about ten grains, it imparts vigour to the stomach and strengthens digestion. Its

tincture, moderately used, has the same effect. Large doses, such as a drachm of the powdered root, or two or three gills of the saturated decoction, produce vomiting and purging, and frequently powerful diaphoresis. In this respect it agrees with many vegetable bitters, and perhaps resembles most nearly the *Eupatorium perfoliatum*. Its bulk, however, and unpleasant taste render it inconvenient to be used as an evacuant.

We are told by authors that the Buck bean has been employed with benefit in intermittent and remittent fevers. Boerhaave, in his own case of gout, was relieved by drinking the juice of the plant mixed with whey. Other physicians have found it useful in keeping off the paroxysms of that complaint. Dr. Cullen informs us, that he has "had several instances of its good effects in some cutaneous diseases of the herpetic or seemingly cancerous kind. It was taken by infusion in the manner of tea." Others have commended this vegetable in rheumatism, dropsy, scurvy and worms. Its reputation in the North of Europe, particularly in Germany, was at one time so high, that it was consumed in large quantities, and deemed a sort of panacea. Its true character, however, is simply that of a powerful bitter tonic, like Gentian and Centaury, to which it is closely

related in its botanical habit, as well as sensible properties.

We may regard this plant as one of the numerous vegetable bitters abounding in our country, which are fully equal in strength to imported articles of their class, and which may hereafter lessen our dependance on foreign drugs.

Linnæus, in his *Flora Lapponica*, informs us, that in times of scarcity, sheep will subsist upon this plant, notwithstanding its bitterness. The Laplanders employ it as a substitute for hops to prevent acescency in their beer. They even introduce it in some instances into their bread, upon which Linnæus bestows the epithet, "amarus et detestabilis."

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PLATE XLVI.

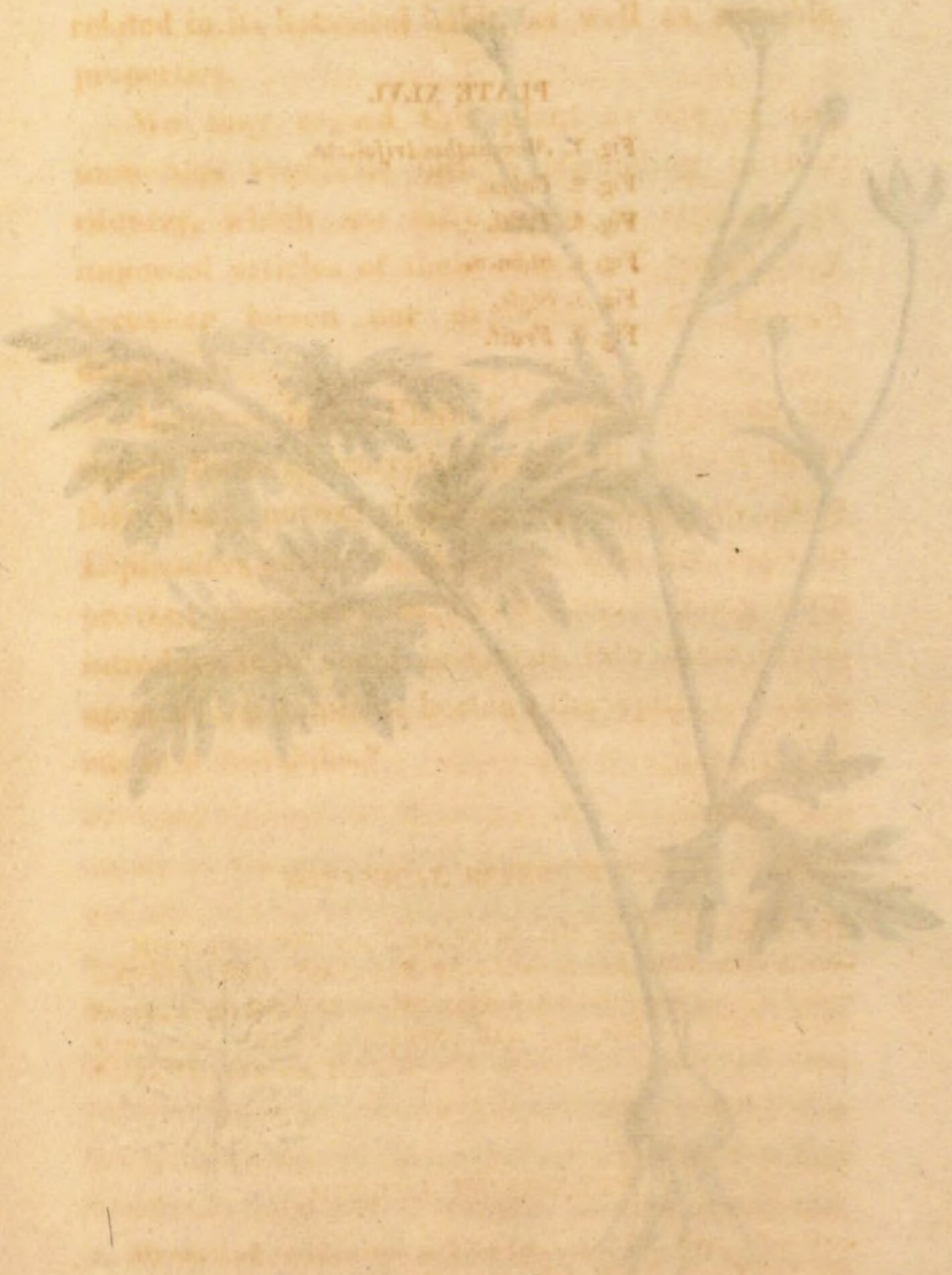
Fig. 1. *Menyanthes trifoliata*.Fig. 2. *Calyx*.Fig. 3. *Petal*.Fig. 4. *Stamen*.Fig. 5. *Style*.Fig. 6. *Fruit*.

related to the botanical all of botany

illustration

PLATE XVII

- Fig. 1. Branch with leaves and fruit
- Fig. 2. Flower
- Fig. 3. Fruit
- Fig. 4. Seed
- Fig. 5. Seedling
- Fig. 6. Seedling
- Fig. 7. Seedling
- Fig. 8. Seedling
- Fig. 9. Seedling
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- Fig. 98. Seedling
- Fig. 99. Seedling
- Fig. 100. Seedling





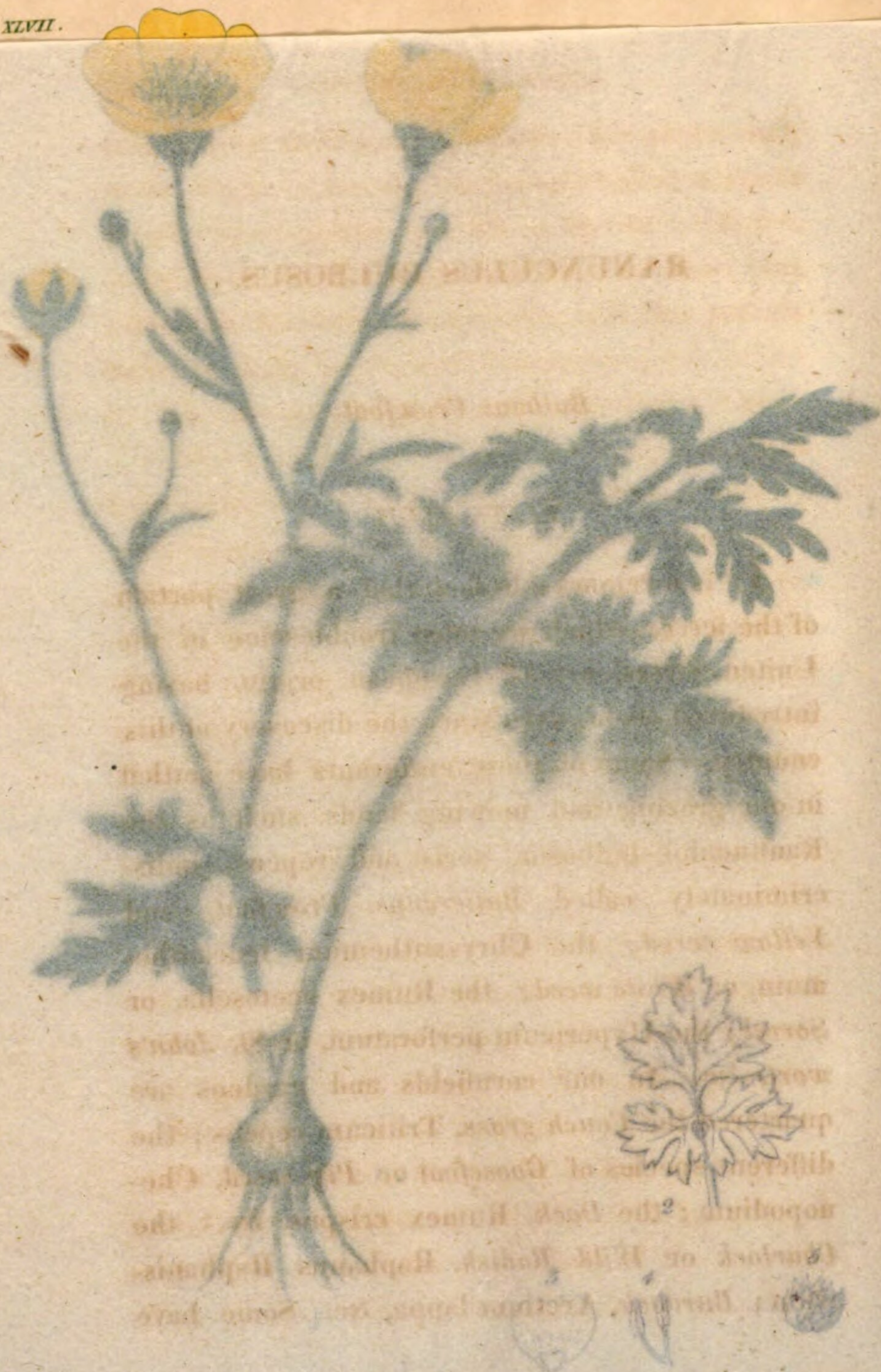
Ranunculus bulbosus

RANUNCULUS BULBOSUS.

Bulbous Crowfoot.

PLATE XLVII.

It is a remarkable fact that a great portion of the weeds, which are most troublesome in the United States, are of European origin, having introduced themselves since the discovery of this country. Some of these emigrants have settled in our grazing and mowing lands, such as the *Ranunculus bulbosus*, *acris* and *repens*, indiscriminately called *Buttercups*, *Crowfoot*, and *Felshew weed*; the *Chrysanthemum leucanthemum*, or *White weed*; the *Rumex acetosella*, or *Sorrel*; the *Hypericum perforatum*, or *St. John's wort*, &c. In our cornfields and gardens are scattered the *Couch grass*, *Triticum repens*; the different species of *Goosefoot* or *Pig weed*, *Chenopodium*; the *Dock*, *Rumex crispus*, &c.; the *Charlock* or *Wild Radish*, *Raphanus Raphanistrum*; *Barlock*, *Arctium lappa*, &c. Some have



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commenced their inroads within a few years, such as the *Cnicus arvensis*, improperly called *Canada thistle*; the *Genista tinctoria* or *Dyer's weed*, &c. —In return for these introductions, we have sent them the *Erigeron Canadense*, and the prolific families of *Ambrosia* and *Amaranthus*.

No race of plants is more familiarly known than the *Ranunculi*. Of numerous species, both native and imported, which we possess; several resemble each other so nearly, as to pass with common observers for the same plant. The great similarity of their properties renders it almost unnecessary in a medical or economical point of view to distinguish them. I have selected the bulbous-rooted species, not because it is more active in its properties than many others, but because it is one of the most common and best known.

The genus belongs to the class *Polyandria*, and order *Polygynia*. It is found in the natural orders *Multisiliquæ*, Linn. and *Ranunculaceæ*, Juss. Its generic character is formed by a *five leaved calyx*; *five petals*, with a *melliferous pore at the base of each*; *the seeds naked*. No genus can be more strictly natural than this. A general resemblance pervades the whole of the species, which indicates their consanguinity at sight.

The nectary, the never failing concomitant of this genus, is a small cavity at the inside of the claw of each petal, generally covered by a flat scale, sometimes surrounded with a concave brim, and at others inclosed in a short cylinder. A subtle and violent acrimony, on which the medical properties seem to depend, is found in most, if not in all, of the species.

The species *bulbosus* has compound leaves, an erect many flowered stem, a furrowed peduncle, reflexed calyx, and bulbous root. It grows generally in dry pastures, mowing lands and road sides, flowering abundantly in May and the first part of June, after which it gives place to its equally abundant successors, *R. acris* and *repens*, which, however, generally prefer a more moist soil. These three species, having flowers of similar size and appearance, are indiscriminately known by the name of *Buttercups*. Their distinction affords a pleasing instance of different combinations of features, forming separate characters for similar plants. The *R. bulbosus* has a furrowed flower-stalk and reflexed calyx; *R. repens* a furrowed flower-stalk and spreading calyx, and *R. acris* a round flower-stalk and spreading calyx.

A more particular description of the plant in our figure is as follows. Root fleshy, solid, roundish, depressed, sending out radicles from its under side. In autumn it gives off lateral bulbs near its top, which afford plants for the next year, while the old root decays. Stems several, erect, round, hairy, branching. Root leaves on long petioles, ternate, sometimes quinate; the segments variously cut, lobed and toothed; hairy. Stem leaves sessile, ternate, the upper ones more simple. Flowers several on a stem, solitary, of a bright glossy yellow. Peduncles furrowed, angular, hairy. Calyx leaves oblong, hairy, bent back against the peduncle. Petals five, inversely heart shaped; the nectary at the claw covered with a small wedge-shaped emarginate scale. Stamens numerous, yellow, with oblong erect anthers. Germs numerous with reflexed stigmas. Fruit a spherical head composed of acute, naked, diverging seeds with recurved points.

The roots of *Ranunculus bulbosus* appear to consist principally of albumen intermixed with ligneous fibres. If the root be macerated in cold water, it gives a solution of this substance, which coagulates in flocks on the application of heat; and undergoes the same process slowly on the

admixture of alcohol. But the most interesting constituent in this, and in most other species, is the acrid principle which pervades every part of the plant in its green state. Like the acrimony of the Arum, it is volatile, and disappears in drying, or upon the application of heat. It differs, however, in not being destroyed by a moderate heat, and in being fully preserved in distillation. I have subjected various species of *Ranunculus* to this experiment, and always found the distilled water to possess a strong acrimony; while the decoction and portions of the plant remaining in the retort were wholly destitute of this property. This distilled water, when first taken into the mouth, excited no particular effect; but after a few seconds a sharp, stinging sensation was always produced. When swallowed, a great sense of heat took place in the stomach. I preserved some of the water distilled from leaves of *Ranunculus repens*, for several months in a close stopped phial; during which time it retained its acrimony undiminished. In winter time it froze, and on thawing had lost this property. Tilebein, as quoted by Dr. Pulteney, in some experiments on this genus of plants, found that water distilled from *R. sceleratus*, on cooling, deposited small crystals, which were hardly soluble in any men-

struum, and were of an inflammable nature. I have not met with an appearance of this kind. The distilled water, however, had a substance dissolved in sufficient quantity to yield a gradual precipitate with some reagents, such as muriate of tin and acetate of lead. The strength of the distilled water is impaired by continuing the operation too long. The acrimony of the plant is expended in a very short time at the boiling heat, and a farther continuance of the distillation brings over only water.

Since the time of Dioscorides [*Note A.*] the acrid and stimulating properties of the Ranunculi have been well known. This acrimony resides in all the species, with the exception of *R. auricomus*, which is said to be mild, and perhaps two or three others. It is so powerful that it speedily inflames or corrodes the lips and tongue, if kept in contact with them. In the nostrils it acts as a violent sternutatory, and if swallowed in considerable quantity, it brings on great pain, heat and inflammation of the stomach, and has even occasioned convulsions and death.

Before the introduction of Cantharides as a vesicatory, different species of Ranunculus were used upon the skin, as external stimulants. Their power of occasioning erosion and ulceration

appears to have been known to the ancients. Different medical writers have given accounts of their mode of operation ; but the most extensive history and investigation is that of Krapf, published at Vienna, in 1766. This work, which I have not seen, is quoted in all its principal facts by Professor Murray of Göttingen in the *Apparatus medicaminum*. According to this author the various species, with which his experiments were made, proved capable of exciting inflammation, blistering and ulceration, when applied to the skin. A slice of the fresh root of *R. bulbosus* placed in contact with the inside of the finger, brought on a sense of burning in two minutes. When taken off, the skin was found without redness, and the sense of heat and itching ceased. In two hours, however, it returned again, and in ten hours a full serous blister was raised. This was followed by an ulcer of bad character and difficult to heal. He remarks that, if the application is continued after the first itching, the pain and subsequent erosion is much greater.

From the accounts given of this species, also of *R. sceleratus*, *R. acris*, and some others, it appears that the leaves, flowers, buds, or roots of these plants, if bruised and applied to the skin, excite redness and vesication. This effect is not

constant, but fails to take place in certain constitutions or at certain seasons of the year. Generally, however, they are said to operate in half an hour, or less, from the time of their application. They are stated to possess the advantage over blisters made by flies, that they never occasion symptoms of strangury.

With a view to their external stimulus they have been used advantageously in rheumatism, the hip disease, hemicrania, and fixed pains of various descriptions. Among the old practitioners, who have recorded instances of their effects, are Baglivi, Storck, and Sennertius. A curious practice, at one time, prevailed in several countries in Europe, of applying the *Ranunculus* to the wrists or fingers, for the cure of intermittent fever. This is mentioned by Van Swieten, Tissot, and some others. In hemicrania it was applied to the head, and in this case it did not produce a discharge, nor break the skin; but occasioned tumefaction of the hairy scalp.

An objection against the use of the *Ranunculi*, as external stimulants, exists in the uncertainty of their operation, and the violent effects which sometimes have followed after they had been applied. Those writers, who have witnessed their application, record instances in which these vege-

table blisters have been followed by deep, ill-conditioned and sloughing ulcers, which were not healed without great difficulty. Tissot mentions an instance, in which an application made to the thumb caused a deep, painful ulcer, which penetrated to the bone, and occupied some months in its cure. In another case the blister spread, in a few hours, over the whole arm, occasioning fever and delirium, and was followed by such a tendency to gangrene, that the limb was with difficulty saved. Chesnau, quoted by Murray, advises that the *Ranunculus* should be applied to a small surface only, and through a perforation in an adhesive plaister, to prevent it from spreading. From want of this caution, he had known extensive inflammation to arise and spread over a greater part of the face, neck, and breast.—Linnaeus, in his *Flora Suecica*, relates that beggars, in Sweden, were known to excite ulcerations of their feet with the *Ranunculus sceleratus*, to assist them in extorting charity from passengers.

I know not to what extent the efficacy of the *Ranunculi*, externally applied, can be depended on. Certain it is that they do not affect all persons alike, and this fact is avowed by those who have used them most. I have repeatedly made applications of the contused roots and

leaves of different species to my arm and hand, and worn them for a dozen hours, without feeling any particular sensation, or perceiving any visible effect. The rapid drying up of the moisture of the plant seemed to prevent it from acting upon the skin. I am inclined to believe, there is something in the action of these vegetables analogous to that of the poisonous species of *Rhus* described in this work; which some individuals, but not all, are susceptible of. The extensive and spreading inflammation, which they occasionally produce, resembles more the effect of these shrubs, than of any of the ordinary rube-faciants or vesicants.

The burning sensation which the *Ranunculi* excite in the mouth when chewed, extends to the stomach if they are swallowed. Krapf states that a small portion of a leaf or flower of *R. sceleratus*, or two drops of the juice, excited acute pain in the stomach, and a sense of inflammation in the throat. He gave a large quantity of the juice to a dog, which brought on vomiting and great distress; and the animal being killed, was found with the stomach inflamed and contracted, and the pylorus hardly pervious. The same author informs us that dilution greatly diminishes the power of this fluid, so that half a

drachm of the juice, in six ounces of water, may be taken with entire safety.

Dr. Withering, as quoted by Dr. Pulteney in the Linnæan transactions, asserts, that the distilled water of *Ranunculus flammula* is an emetic more instantaneous and less offensive than sulphate of zinc. I know not in what publication of Dr. W. this statement is made, but the fact appears to me not improbable. Acrid substances, such as mustard, pepper, and horse-radish, if swallowed in large quantities, excite the stomach to relieve itself by vomiting. An objection, however, exists against the distilled water, owing to the uncertainty of its strength; which must vary in proportion to the quantity of the plant employed, the time occupied in distillation, and the subsequent time for which the fluid is kept.

Krapf states that *R. auricomus* and *R. lanuginosus* are so free from acrimony, that they are eaten as greens or sallads. All the species lose their pungency in boiling, so that even the *R. sceleratus*, one of the most acrid, is used for the same purpose.

Grazing cattle generally avoid the plants of this genus, which grow among grass, as far as it is possible for them to do it. Accordingly we observe the flowers of *Ranunculi* left untouched,

while the grass is closely cropped around them. It is nevertheless unavoidable, so common are these plants, that portions of them should be eaten very often by these animals. It is probable that small quantities of the less acrid sorts do them no injury. At least, it appears that their stomachs are much less susceptible to this kind of stimulus than ours. In the *Pan Suecus* some experiments upon these plants, with domestic animals, are detailed ; in which, it is stated that, horned cattle refused to eat all the species when offered to them, except *R. auricomus*. This species was rejected by horses, while they would eat *R. flammula*. Sheep and goats eat the *R. acris*, one of the most pungent species. Dr. Pulteney states, as a well known fact, that hogs, in England, devour the roots of *R. bulbosus*. How it is that these animals resist the deleterious effects of so virulent plants, it is not easy to say. It is, however, a not more remarkable fact, than the power of some animals to devour *Cantharides* and even mineral poisons with impunity.*

In their dry state, various species of *Ranunculus* enter into the composition of hay, particularly *R. acris*. Having lost their acrimony altogether in drying, they are harmless and probably nutritive.

* See a note, vol. i. p. 164.

Dr. Pulteney has published a memoir in the Linnæan transactions on the economical use of some of the Ranunculi, particularly the *R. fluvialis*, which he considers a variety of *R. aquatilis*. Contrary to the common effects of the other species, this plant is said, by him, to be not only innocent, but highly nutritive to cattle. He states that, "in the neighbourhood of Ringwood, on the borders of the Avon, which affords this vegetable in great abundance all the year, some of the cottagers sustain their cows, and even horses, almost wholly upon this plant; since the remaining part of their food is nothing more than a scanty pittance, they get on the adjacent heath, which affords little more than Ling, Lichen, Bog-moss or Sphagnum, &c. It is usual to employ a man to collect a quantity for the day every morning, and bring it in the boat to the edge of the water, from which the cows, in the instance seen, stood eating it with great avidity. I was indeed informed," says he, "they relished it so highly, that it was unsafe to allow them more than a certain quantity; I think between twenty five and thirty pounds daily, each; but with variation according to circumstances. The cows I saw were apparently not in a mean condition, and gave a sufficient quantity of good milk. I

was told by the person whose cattle were feeding on it, that he kept five cows and one horse so entirely on this plant and what the heath afforded, that they had not consumed half a ton of hay throughout the whole year; none being used except when the river was frozen over. I examined the whole parcel on which four cows were feeding, in the beginning March, and found the whole consisted exclusively of the *Ranunculus fluviatilis* without any mixture of the *Potamogeton*, *Carex*, *Sparganium*, or other aquatic plants. In summer, however, it can hardly be avoided but that there must be a mixture of some of these, but other plants are not chosen.

“This account was confirmed to me by different persons; by whom I was further informed that hogs are also fed with the same plant, on which they improve so well, that it is not necessary to allow them other sustenance, till it is proper to put them up to fatten.”

In Veterinary practice the *Ranunculus bulbosus* has been employed as an external stimulant. To this purpose Dr. Chapman, in his *Therapeutics*, thinks it may be better adapted than other topical excitants.

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PLATE XLVII.

Fig. 1. *Ranunculus bulbosus*, the radical leaf of the largest size and more subdivided than common.

Fig. 2. Radical leaf of smaller size and more common shape.

Fig. 3. Petal and nectary.

Fig. 4. Two stamens enlarged.

Fig. 5. Fruit.

ILlicium FLORIDANUM.

Starry Anise.

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PLATE XLVIII.

THE same qualities which entitle the Liriodendron and Magnolias to a place among medicinal plants, exist abundantly in the kindred genus of Illicium. This family consists of fine, spicy, flowering shrubs, one of which, the *I. anisatum*, growing in Eastern Asia, derives its name from the similiarity of its flavour to that of Anise, a quality which exists, though less simple, in the subject of the present article. Another species, the *I. parviflorum*, a shrub with small yellowish flowers, first discovered by Michaux in the mountains of Georgia and Carolina, has so exactly the flavour of the Sassafras root, that they are not to be distinguished by the taste. The *I. Floridanum* forms beautiful thickets in the country bordering on the north of the Gulf of



Illicium Floridanum

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Illicium Floridanum

flexion, and is often interrupted by the cross-
rib, which is sometimes very prominent, as in
of the chief branches of the subventral region.
In the middle of the stem, as well as in the
is present of the middle part. The drawing
which illustrates the description, was made from
a very fine specimen.
The character assigned to this genus is
formed by a six leaved calyx, having seven petals,
and a number of capules arranged in a circle, two
of which are shaded. The species *Floridum* has
its leaves to minute, and its petals numerous,
shaded, and small.
The other two species are *Floridum*, *Floridum*,
and the natural order *Scandentia*, *Linn.*
Floridum, *Scandentia*, *Linn.*
The *Floridum*, *Scandentia* is a shrub, in some
instances reaching to the height of a small tree,
its leaves are arranged, or grow in tufts, on short
petioles. They are evergreen, oval lanceolate,
slightly acuminate entire, smooth on both sides,
and turn of flesh. The flower buds proceed from
the sides of the branches in the axils of the last
year's leaves. The flowers grow on slender,
arching peduncles, an inch or two long. When
fully expanded they are about the size of a dollar
and of a dark, purplish crimson. Calyx three-

Mexico, and is often mentioned by the traveller Bartram, with his accustomed enthusiasm, as one of the chief beauties of that exuberant region. In the Northern states, as well as in Europe, it is preserved by artificial heat. The drawing, which illustrates our description, was made from a greenhouse specimen.

The character assigned to this genus is formed by a *six leaved calyx, twenty seven petals, and a number of capsules arranged in a circle, two valved, one seeded.* The species *Floridanum* has its *leaves acuminate and its petals numerous, oblong and linear.*

The class and order are *Polyandria, Polygynia*; and the Natural orders *Coadunatae, Linn. Magnoliæ, Juss.*

The *Illicium Floridanum* is a shrub, in some instances entitled to be considered a small tree. Its leaves are scattered, or grow in tufts, on short petioles. They are evergreen, oval lanceolate, slightly acuminate, entire, smooth on both sides, and firm or fleshy. The flower buds proceed from the sides of the branches at the axils of the last year's leaves. The flowers grow on slender, nodding peduncles, an inch or two long. When fully expanded, they are about the size of a dollar, and of a dark, purplish crimson. Calyx deci-

duous. Petals linear, obtuse, in three rows, about nine in a row, the uppermost row ascending, the lowermost descending, and broader or more spatulate. Stamens thirty or more, diverging, flat, depressed with the anthers recurved; pollen white. Germs a dozen or more, roundish-rhomboidal, compressed and arranged in a circular manner; styles short, recurved, pubescent on the inside. The fruit, which I have not seen, is represented by authors, as has been stated in the generic character.

The leaves and young shoots of this species of Starry anise abound in a fine, clear mucilage, which becomes immediately perceptible in the mouth, if these parts are chewed, and which communicates to water in a short time a ropy consistence. This mucilage is separated from the decoction by alcohol in the form of dark brown, tough, stringy coagula. Muriate of tin causes a precipitate after these coagula are withdrawn, which seems to indicate the presence of extract. Sulphate of iron added to the decoction, coagulated the mucus and darkened the colour. I discovered no traces of resin in the portions submitted to experiment, and a strong tincture was not disturbed by water. The trial, however, was conducted on a small scale.

The bark and leaves of the *Illicium Floridanum* are strongly impregnated with a spicy, aromatic taste and smell, approaching that of the *Magnolias* and *Liriodendron*, but perhaps more similar to that of some of the pungent seeds, particularly *Anise* and *Coriander*, between which they seem intermediate. This aroma is preserved in the distilled water, and fills the room with its fragrance, while distillation is going on. I was not able in my limited experiments to separate any volatile oil or camphor, on one of which principles, as in similar cases, the aroma doubtless depends.

An account of this species of *Illicium* is given, with a figure, in the *Philosophical transactions* for 1770, by John Ellis, Esq. He says, "We are indebted for the discovery of this curious American tree to a servant of William Clifton, Esq. of West Florida, who was sent to collect specimens of all the rarer plants by his master; and in April 1765, he met with it growing in a swamp near Pensacola. After this, in the latter end of January 1766, Mr. John Bartram, the king's botanist for the Floridas, discovered it on the banks of the river St. John, in East Florida, as appears from his description of it, and a drawing of a seed-vessel with some of the leaves, sent

to Mr. Collinson." Mr. Bartram's description of it, as it appears in his journal up the river St. John, published by Dr. Stork, in his account of East Florida, is as follows. "Near here my son found a lovely, sweet tree, with leaves like the sweet bay, which smelled like Sassafras, and produces a strange kind of seed-pop; but all the seed was shed. The severe frost had not hurt it;—some of them grow nearly twenty feet high, a charming bright evergreen aromatic."*

Of the medicinal properties of this shrub, I am unable to speak with the certainty, which might have attended an extensive number of trials, made with the bark of full grown specimens. From the evidence afforded by the bark and leaves of a greenhouse specimen, and by the analogy of other species, and similar trees, I should not feel much hesitation in attributing to the *Illicium* the properties of a tonic-stimulant and diaphoretic. I have at least satisfied myself that the bark of a twig, and three or four of the leaves, produce no unpleasant consequence. Its bitter taste and aromatic quality point out its analogy to *Cascarilla*, *Canella*, *Sassafras*, and other aromatic barks, which are regularly consumed in the shops. Its

* It is very possible the above description may have been intended for *Illicium parviflorum*.

co-species, the *Illicium anisatum* of the East, is used as a condiment to communicate an agreeable flavour to certain dishes. The Chinese chew it after dinner as a stomachic and a sweetener of the breath. In some parts of the East Indies the natives and Dutch mix it with their tea and sherbet. It is also burnt as incense before their idols by some of the oriental nations, and carefully kept as an antidote to various poisons.

The beauty of both these shrubs renders them desirable acquisitions to collectors of plants.

BOTANICAL REFERENCES.

Illicium Floridanum, LINN.—CURTIS, *Bot. Mag.* t. 439.—MICHAUX, i. 526—PURSH, ii. 330.

MEDICAL REFERENCES.

ELLIS, in *Philosophical transactions abridged*, xiii, 87. t. 2.—SCHÆPF, 91.

PLATE XLVIII.

Fig. 1. *Illicium Floridanum*.

Fig. 2. Several stamens magnified.

Fig. 3. Pistils magnified.

Fig. 4. A pistil separate.

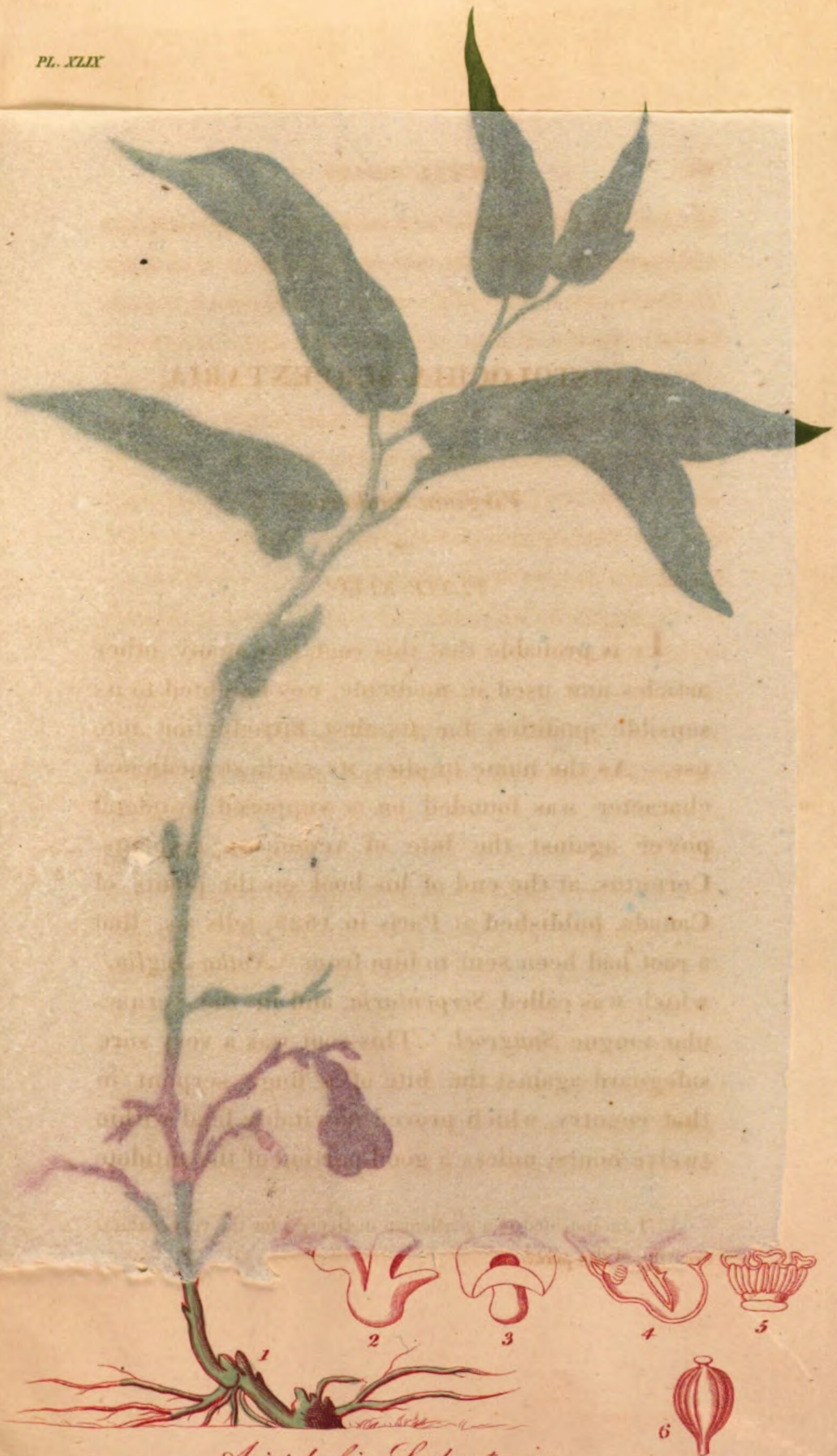
ARISTOLOCHIA SERPENTARIA.

Virginia Snakeroot.

PLATE XLIX.*

It is probable that this root, like many other articles now used in medicine, was indebted to its sensible qualities, for its first introduction into use. As the name implies, its earliest medicinal character was founded on a supposed antidotal power against the bite of venomous serpents. Cornutus, at the end of his book on the plants of Canada, published at Paris in 1635, tells us, that a root had been sent to him from "*Notha Anglia*," which was called *Serpentaria*, and in the vernacular tongue *Snagröel*. This root was a very sure safeguard against the bite of a huge serpent in that country, which proved inevitably fatal within twelve hours, unless a good portion of the antidote

* I am indebted to a gentleman in Georgia for the very natural drawing of this plant.



Aristolochia Serpentaria

ARISTOLOCHIA SERPENTARIA

Virginia Snake-root.

PLATE XLIX

It is probable that this root, like many other articles now used in medicine, was introduced by the remarkable expedition, for the first introduction of this root. In the year 1684, the English established themselves at the mouth of the river, and a report of its efficacy against the bite of venomous serpents, Cornutus, at the end of his book on the plants of Canada, published at Paris in 1685, tells us, that a root had been sent to him from "North America" which was called *Serpentaria*, and in the vernacular tongue *Snagrœl*. This root was a very sure safeguard against the bite of a huge serpent in that country, which proved inevitably fatal within twelve hours, unless a good portion of the antidote

was presented to a gentleman in Georgia for the very natural drawing of this plant.



Aristolochia Serpentina

was swallowed in season ; which being done, no one was ever known to be in danger of his life from this cause.

The snagröel has had a great many rivals in the character of specifics against the bite of serpents. So great, indeed, is the number of articles which are called uniformly successful in such cases, that we are compelled to believe, that the bite of the rattle snake, and doubtless of other venomous serpents in the country, although attended with severe and alarming consequences, is nevertheless but seldom fatal ; and hence that the honor of proving specific in these cases is one of cheap acquisition.

The *Serpentaria* grows in woods in the Southern and Middle parts of the United States. It bears cultivation in any part of the union, though the most northerly situation, from which I have received wild specimens, is the vicinity of New Haven, from which place some living plants were sent to me by Dr. Monson.

The genus *Aristolochia* has a *monopetalous, tubular, crooked corolla, swelling at base, and dilated at the border. Capsule inferior, six celled.* The species *Serpentaria* has its *leaves heart-shaped, oblong, acuminate ; stem flexuous ; peduncles radical.* Pursh mentions a variety with

leaves so narrow, as to appear like a distinct species; the flower, however, being not different. Woodville's figure of our plant has the leaves much too broad for the common habit of the vegetable.

It belongs to the class *Gynandria*, order *Hexandria*, or more properly *Dodecandria*. It is one of the few genera placed by Linnæus in that class which are not of the Orchideous tribe. Natural orders *Sarmentaceæ*, Linn. *Aristolochiæ*, Juss.

This vegetable is humble in its growth, being most commonly under a foot in height. The root is extremely fibrous, and sends up a number of stems. These are simple or slightly branched, jointed, flexuous, and often of a reddish tinge. The leaves are alternate, on short petioles, oblong, entire, acuminate, heart-shaped at base and three nerved.

The flowers grow close to the ground, like those of *Asarum*. They have a stiff leathery texture, and a dull brownish purple colour. The peduncle which supports them has one or more leaflets, and gradually enlarges into a furrowed obovate germ. The corolla, like others in this singular genus, consists of a long contorted tube, bent in the form of the letter S, swelling at its

two extremities, having its throat surrounded by an elevated edge or brim, and its border expanded into a broad irregular margin, forming an upper and under lip, which are closed in a triangular manner in the bud. The anthers are twelve in number, growing in pairs to the sides of the fleshy style, which is situated in the bottom of the corolla, and covered by a firm, spreading convoluted stigma, which extends over the anthers. The capsule is obovate, six angled, six celled, with numerous small flat seeds.

Snakeroot has a penetrating, rather agreeable, resinous smell, and a pungent bitter taste, resembling somewhat that of the *Pinus Canadensis*, or Hemlock spruce. It communicates its qualities both to spirit and water, but most to the former. I subjected a quantity of the root to distillation for one hour, and obtained in the receiver a whitish pearly fluid, very strongly impregnated with the aroma, but less bitter than the root. On standing twenty four hours, this fluid deposited round the edges of the surface a considerable number of small white crystals, which proved to be pure camphor. They were inflammable, fusible with a sudden, and volatile with a gradual heat. I perceived no essential oil, though Dr. Lewis informs us, that if the

quantity of root, submitted to the operation, be large, there arises a small portion of pale coloured essential oil of a considerable smell but of no very strong taste. There is probably a portion of resin present, as I found that the root, after having been boiled in water an hour, still impregnated alcohol so as to cause a precipitate with water. The bitterness communicated to the infusion and decoction appears to reside in a variety of extractive matter.

Medicinally considered, *Serpentaria* is a tonic, diaphoretic, and in certain cases an antispasmodic and anodyne. It has been abundantly used in fevers of various descriptions, and has been commended by a host of medical writers. There is no doubt that it has been injudiciously employed in many cases, in fever attended with an active pulse and inflammatory diathesis. The early stages, also, of febrile diseases rarely admit the exhibition of so decided a stimulant, without injury. But in the advanced stages of fever and those attended with typhoidal symptoms, this medicine is resorted to with great advantage, both alone and in combination with other tonics and stimulants. It is peculiarly useful in supporting the strength, and in allaying the irregular actions which attend great febrile debility, such as

subsultus tendinum, delirium, watchfulness, &c. Its bitter ingredients, and the camphor which it contains, no doubt contribute to these effects. It is most advantageously given in combination with bark, or with wine and opium.

Snakeroot is a popular remedy in exanthematous disorders as a diaphoretic, being given to keep out the eruption, and to restore it when it has receded. In the latter case its use is doubtless injudicious, and if it fails to reproduce the eruption, it greatly increases the heat, pain, and restlessness of the patient. It is better in cases where the eruption has receded to the disadvantage of the patient, to attempt its restoration by nauseating and saline diaphoretics, and even by a full emetic, than to incur the risk of aggravating the symptoms by a stimulating regimen.

Dr. Chapman, in his Therapeutics, considers the *Serpentaria* as partaking the mixed qualities of a stimulant and tonic, and acting also as a diaphoretic and diuretic. It is peculiarly useful as an auxiliary to the bark. He states, that one of the more early uses of the medicine was in the cure of intermittent fever. Whether alone it was found adequate to this purpose, does not clearly appear. "It was used by Sydenham in conjunction with wine, to prevent the recurrence of

the paroxysm, and from his account, not without advantage. As a general rule, he says, that in all cases, where it is expedient to combine wine with bark, the effect will be much increased by adding *Serpentaria*. The correctness of this observation has been fully confirmed by subsequent experience, and it is now very much the practice to unite the two articles in the low states of disease."

Dr. Chapman farther states, that though it is doubtful whether the *Serpentaria*, by itself, will cure ague and fever, it is certainly a powerful assistant to bark, not only in increasing its efficacy, but, what is of great consequence, in enabling the stomach to retain the medicine.

To remittent fever he thinks this medicine better adapted. It has here, in many cases, an indisputable superiority over bark, inasmuch as it is rarely offensive to the stomach, and may be given without injury, in those obscure states of the disease, where the remission is not readily discernible. He prefers, in these cases, a combination of bark, snakeroot, and soda.

Snakeroot, he informs us, is much resorted to as a popular remedy in the management of the secondary stages of pleurisy. After bleeding, it is the ordinary practice, in many parts of our

country, to resort to a strong infusion of this article with a view of exciting perspiration. Catarrhs, rheumatisms, and other winter complaints, incident to rustic life, are managed in the same way. In that species of pleurisy which is properly enough designated by the epithet bilious, he has repeatedly had occasion to recur to the *Serpentaria*, and always with more or less utility. This bilious pleurisy he considers as having all the characters of pneumonic inflammation, with the addition of some of the symptoms incident to autumnal fever, such as headach, great gastric distress, and almost always violent vomitings of bile. It differs also from ordinary pleurisy in having less activity of inflammation, and consequently in not bearing the same extent of depletion. The system, indeed, will often be very evidently depressed by one or two bleedings. In this case the practice which has been commonly pursued is, after the removal of a comparatively small portion of blood, and the thorough evacuation of the alimentary canal; to administer very freely draughts of the infusion of the *Serpentaria* in order to excite copious diaphoresis.

Dr. Chapman concludes his remarks on this article, by stating, that it is admirably suited to check vomitings, and to tranquillize the stomach,

more particularly in bilious cases. It is given for this purpose in decoction, in the small dose of half an ounce or less at a time, and frequently repeated.

The most common form of exhibiting snake-root is in infusion, for which purpose half an ounce may be steeped in a pint of boiling water for two hours, in a covered vessel. Of this infusion an ounce or two may be taken every three or four hours. Decoction is a less proper mode of preparing this plant, as it tends to dissipate the volatile parts, a portion of which is detained in a state of mixture by the infusion. Sometimes the powder is given in doses of from ten to thirty grains. A tincture of snakeroot is made by digesting an ounce of the root in a pound or somewhat less of proof spirit. The compound tincture of bark, commonly called Huxham's tincture, contains *Serpentaria* as one of its ingredients.

BOTANICAL REFERENCES.

Aristolochia serpentaria, LINN. *Sp. pl.*—WALTER, *Flor. Car.* 223.—WOODVILLE, ii. 291. *t.* 106.—MICHAX, ii. 162.—PURSH, ii. 596.—*Pistolochia sive Serpentaria Virginiana*, &c.—PLUKENET, *t.* 148. *f.* 5.—CATESBY, *Car.* i. 29.

MEDICAL REFERENCES.

MURRAY, *App. Med.* i. 348.—CULLEN, *Mat. Med.* ii. 85.—CHAPMAN, *Therapeutics*, ii. 411.—LIND. *Hot climates*, 104, 254.

PLATE XLIX.

Fig. 1. *Aristolochia serpentaria* with the flower beginning to expand.

Fig. 2. Side view of the flower expanded.

Fig. 3. Front of ditto.

Fig. 4. Longitudinal section of the flower.

Fig. 5. Style, anthers, and stigma magnified.

Fig. 6. Fruit.

19
ALETRIS FARINOSA.

Star Grass.

=

PLATE L.

I know of no plant which surpasses the *Alteris farinosa* in genuine, intense and permanent bitterness. Neither aloes, gentian, nor quassia exceed it in the impression produced on the tongue. It has, on account of this property, attracted the observation of some medical men, and may hereafter become an article of more consequence in the *Materia Medica*. Although the number of trials, hitherto made, are perhaps not sufficient to fix with precision its exact character, yet in a collection of American medicinal vegetables it ought not to pass unnoticed.

This plant grows in most parts of the United States in fields and about the edges of woods, and flowers in June and July. I have found it near Boston on the south, but never to the north of it.

ALETIS FARINOSA

Star Grass.

PLATE I.

I know of no plant which possesses the Alteris farinosa in genuine, intense and permanent bitterness. Neither does, greater nausea excite it in the impression produced on the tongue. It has, on account of this property, attracted the observation of some medical men, and may hereafter become an article of some consequence in the Materia Medica. Although the number of trials, hitherto made, are not sufficient to fix with precision its exact character, yet in a collection of American medicinal vegetables it ought not to pass unnoticed.

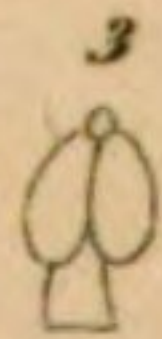
This plant grows in most parts of the Eastern States in fields and about the edges of woods. It flowers in June and July. I have found it near Boston on the coast, but never to the north of it.



Annin & Smith Jr



Aletis farinosa



its mode of growth is not without beauty, the leaves spreading close to the ground in a radiated manner, like a star, while the spike is supported by an almost naked stalk at a distance above them. The leaves are linear and bluish green and generally given to it in the country from the peculiar appearance of its leaves.

The genus *Albizia* has its corolla tubular; six-lobed, persistent; always inserted into the base of the segments; style triangular, separate from the tube; capsule opening at top, tube called many-seeded. The species *Albizia* called also *Albizia* and *Albizia*, has its flowers pedicelled, the tube of the capsule twisted in fruit; the leaves broad lanceolate. *Albizia* observes that of the species related by Linnaeus to this genus the *Albizia* is the only one which strictly belongs to it. Class *Monocotyledon*, order *Monoglossis*, natural order *Albizia*, family *Leguminosae*.

This plant has a very large and smooth, and smooth. The stem is very thick and is from four to six feet high, and is very much branched, which sometimes expand into small leaves. The flowers form a slender, scattered spike with very short pedicels and minute bracts. Calyx none. Corolla white.

Its mode of growth is not without beauty, the leaves spreading close to the ground in a radiated manner, like a star; while the spike is supported by an almost naked stalk, at a distance above them. The names *Star Grass* and *Blazing star* are generally given to it in the country, from the peculiar appearance of its leaves.

The genus *Aletris* has its *corolla tubular, six cleft, wrinkled, persistent; stamens inserted into the base of the segments; style triangular, separable into three; capsule opening at top, three celled, many seeded.* The species *farinosa*, called *alba* by Michaux and Pursh, has its *flowers pedicelled, oblong-tubular, somewhat wrinkled in fruit; the leaves broad lanceolate.* Michaux observes that of the species referred by Linnæus to this genus, the *A. farinosa* is the only one which strictly belongs to it. Class *Hexandria*; order *Monogynia*; natural orders *Liliaceæ*, Linn. *Asphodeli*, Juss.

This plant has a single circle of radical leaves, which are sessile, nerved, lanceolate, and smooth. The stem or scape is from one to three feet high, invested with remote scales, which sometimes expand into small leaves. The flowers form a slender, scattered spike with very short pedicels and minute bractes. Calyx none. Corolla white,

of an oblong bell-shape, divided at the mouth into six acute, spreading segments. The outside, particularly as the flower grows old, has a roughish, wrinkled or mealy appearance, by which the specific name was suggested. The stamens are short, inserted near the mouth of the corolla at the base of the segments. The circumstance of their being opposite to the segments, and not alternate with them, affords the most distinguishing mark of this genus. The anthers are somewhat heart-shaped. Germ pyramidal, half inferior, tapering: style triangular, separable into three. Capsule invested with the permanent corolla, triangular, three celled, three valved at top. Seeds numerous, minute, fixed to a central receptacle.

The *Aletris aurea*, of Michaux and Pursh, closely resembles this species, and it is difficult, by comparing specimens of the two, to point out any permanent distinctive marks. The leaves of *A. aurea* are somewhat narrower and the flowers bright yellow. Walter places it under *A. farinosa* as a variety, and adds that he could not detect a specific difference; although the time of flowering and place of growth indicate that they are distinct. In sensible properties they are similar.

In the London Philosophical transactions for 1730, a plant is mentioned by Clayton, which, though not described in botanical language, leaves little doubt that the *Aletris farinosa* is intended. He says, "there is another root of the species of hyacinths; the leaves are grass-like, but smooth and stiff, of a willow-green colour, and spread like a star on the ground. From the middle shoots a tall, long, rush-like stem, without leaves, near two feet high; on one side grow little white bell-flowers one above another. The root is black outwardly, but brown within. It is bitter and probably has the same virtues as Little Centaury. Some call it *ague grass*, others *ague root*, others *star grass*."

The root of the *Aletris* is highly resinous, and appears to contain a portion of extractive matter. The tincture, made by digesting the root in alcohol, is intensely bitter, and assumes a milky turbidness if water be added to it. The decoction is moderately bitter, and is not disturbed by alcohol. With chalybeate solutions it undergoes little change. The tincture is to be considered a stronger preparation than the decoction, although the latter has a good share of the virtues of the plant.

The bitterness of this vegetable has brought it into notice in the quality of a tonic and stomachic. I have been informed of its use for this purpose by physicians in different parts of the country. The most common mode of its employment, I understand, is by infusion or decoction. Pursh speaks of it as a remedy in the colic, but on what principle it can operate in relieving that disease, I am at a loss to say.—The amount of bitter resin, which the plant contains, led me to suspect that it might possess some of the properties of aloes, to which the plant is botanically related; but on trial, made in several instances with the root in powder, a dose of ten or twelve grains produced no effect of this kind whatever. A physician, who experimented with larger quantities, with a view to test this quality, informed me that a dose of twenty grains occasioned much nausea and tendency to vomit, followed by some dizziness; but that no cathartic operation took place.

Dr. Cutler, in his account of the plants of New England, informs us, that this plant has been considered useful in chronic rheumatism; but does not mention the dose or preparation.

As far as we can sum up the testimony hitherto offered respecting the general properties of

this plant, it appears that the infusion or decoction acts as a tonic in small doses. Indeed the exhibition of large ones would be inconvenient from the extreme bitterness of the plant. The powder, in small quantities, produces no immediate visible effect, except that it has appeared to invigorate the appetite. In large doses it disturbs the stomach, and possibly exerts some narcotic effect on the system. It remains to be determined whether these consequences are attributable to the resin, which the infusion does not dissolve; or whether the largeness of the dose is alone instrumental. It is well known that the stomach does not tolerate even gentian or any common bitter in large a dose. And it seems probable that if the Aletris should ever increase in reputation as a tonic bitter, it will only be by its use in limited quantities.

BOTANICAL REFERENCES.

Aletris farinosa, LINN.—WILLD. *Sp. pl.* ii. 183.—*Bot. Mag.* t. 1418.—Aletris alba, MICHAUX, *Flora.* i. 189.—PURSH, i. 225.—Hyacinthus floridanus spicatus, PLUKENET, *amalth.* 119, t. 437, f. 2.—Hyacinthus caule nudo, &c.—GRONOV. *Virg.* 38.

MEDICAL REFERENCES.

CLAYTON, *Phil. Trans. abr.* viii. 333.—CUTLER, *American Acad.* vol. i. 435.

PLATE L.

Fig. 1. *Aletris farinosa*.

Fig. 2. Corolla opened to shew the insertion of the stamens.

Fig. 3. Stamen magnified.

Fig. 4. Pistil magnified.

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MEDICAL RESEARCH

CLARK, J. H. (1911). The effect of the administration of the
 vol. 1, 1911.

PLATE I

Fig. 1. Altered form.

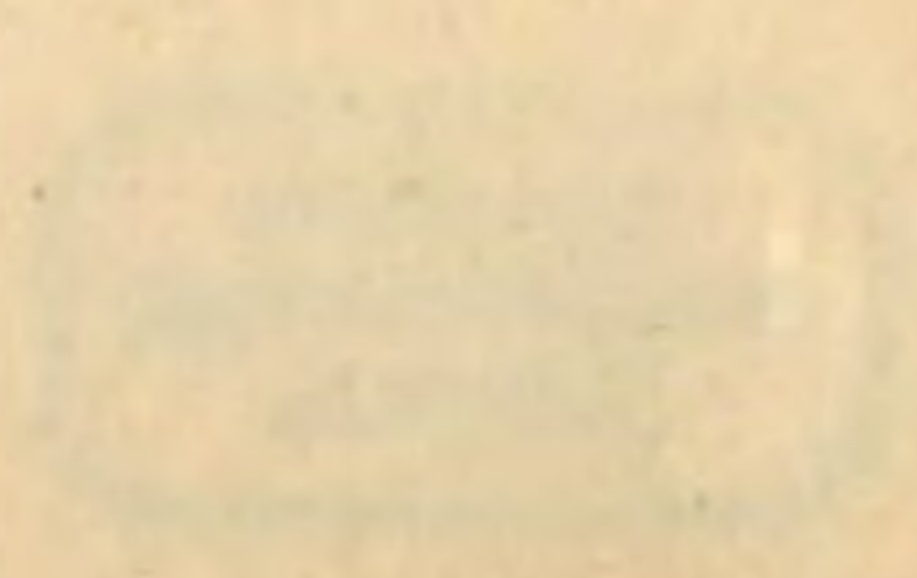
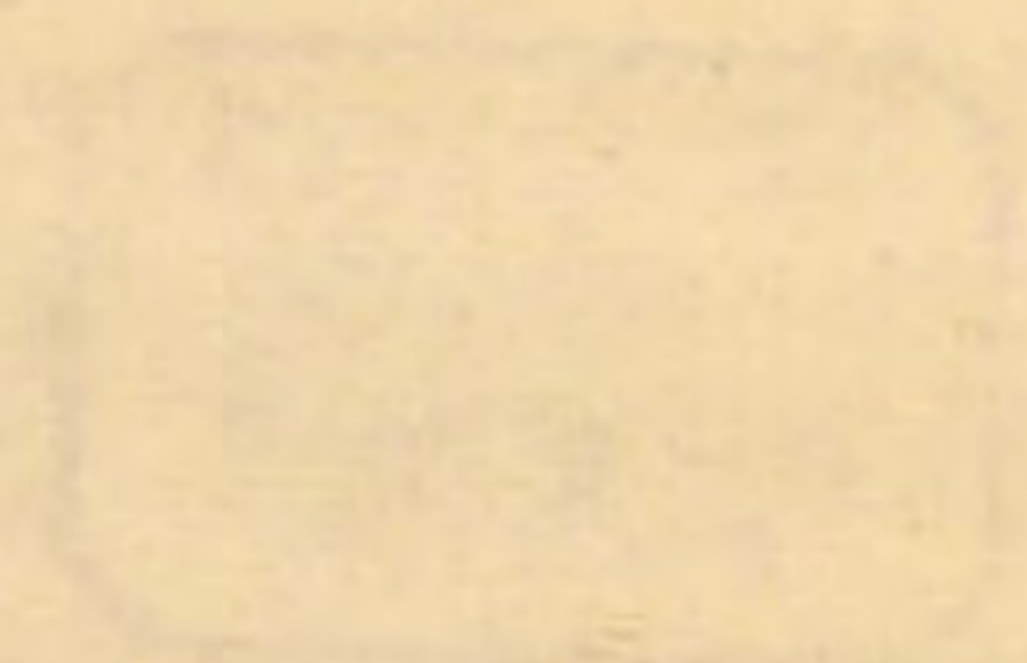
Fig. 2. Inside opened to show the structure of the interior.

Fig. 3. Same as magnified.

Fig. 4. Detail magnified.

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PLATE I
Fig. 1. *...*
Fig. 2. *...*
Fig. 3. *...*
Fig. 4. *...*





Bigelow, Jacob

American Medical Botany being a Collection of the Native medicinal Plants
of the United States, containing their Botanical History and Chemical
Analysis ...
Bd.: 3,1

Boston (1820)

M.med. 121 m-5

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